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Scope of This Index

This Index is divided isto three sections—Subjects, Places, and Authors. Under each heading in the three sections the order of listing is by sequence of publication.

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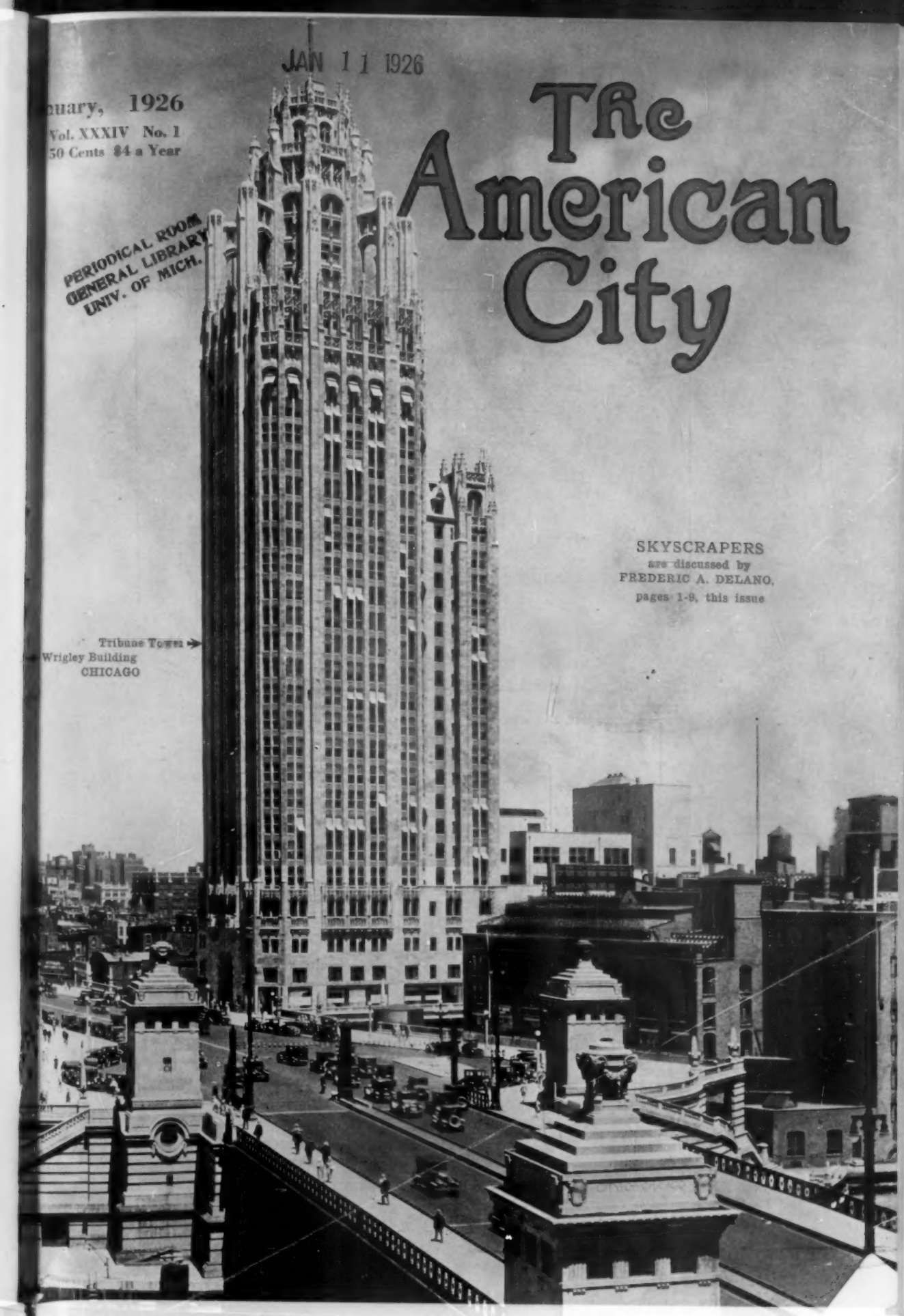

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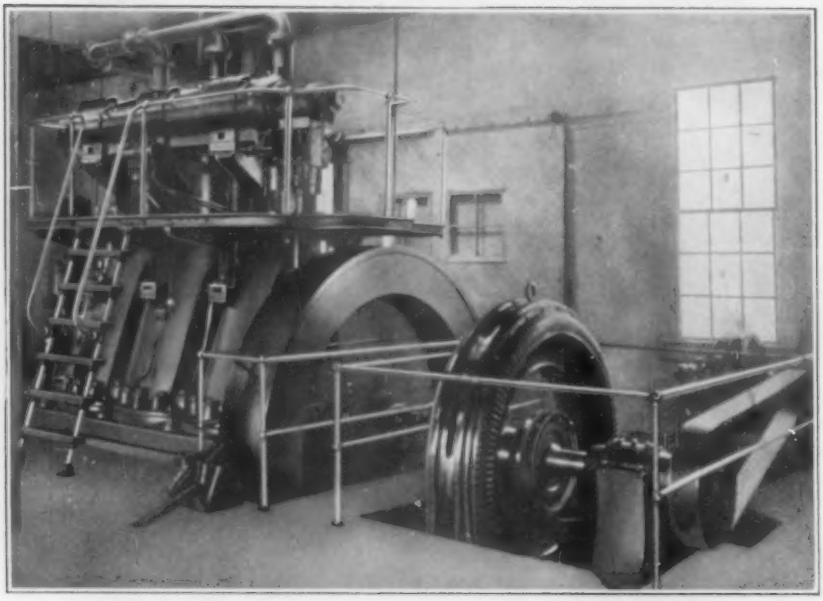

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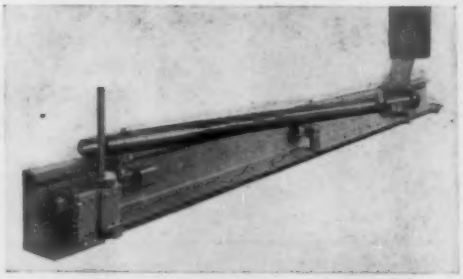

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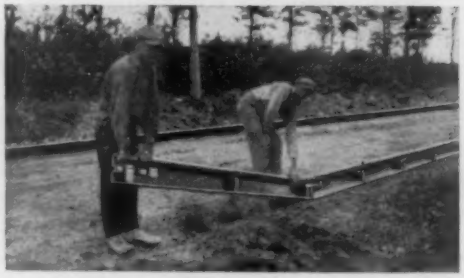

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Skyscrapers

By Frederic A. Delano

President, American Civic Association; Chairman, Regional Plan of New York and Its Environs

MANY people interested in the development of cities are alarmed at the growing menace of high buildings. To others, on the other hand, the high building is a great convenience. The rapidly moving elevator substitutes vertical for horizontal motion, and in the many-storied office building one can find the maximum number of offices with the minimum of exertion.

It is obvious, however, that by far the larger proportion of the population gives the subject little thought and is oblivious to the far-reaching effects. They do not see that whereas city planning was formerly a problem in two dimensions, it has now become a problem in three dimensions; or, to put it in another way, the difficulty of the problem is increasing not as the square of the population, but more nearly as the cube.

To thoughtful people, at least, the subject will appear to be one of sufficient importance to warrant careful consideration, if not actual study. And in this study it will at once appear that there is a good deal to be said on both sides.

The history of the tall building does not go very far back. This, of course, does not refer to tall towers and spires, but to the many-storied buildings whose upper floors are occupied by a large day or night population. The genesis of the present type of steel skeleton frame construction dates hardly forty years back and the general application of the principle did not start until ten or fifteen years later.*

The skyscraper was made possible both by the high state of the art in rolling and fabricating steel beams, and by the invention of the rapidly moving passenger elevator. From comparatively modest beginnings the erection of buildings of this general type has advanced very rapidly. It is not confined by any means to great cities like New York and Chicago, where it is often argued that the area available for given purposes is so much contracted by geographical conditions as to make high buildings necessary, but is to be found all over our land, even in comparatively small cities where there is ample room to expand, and where it would be better for the community if excessive concentration were avoided. It is noticeable that every American city and town that aspires to metropolitan importance wants to have at least one skyscraper—one that can be illustrated on a picture postcard and sent far and wide as an evidence of modernity and a go-ahead spirit. In our larger cities, and certainly in practically every city of 100,000 inhabitants or over, the skyscraper is creating problems which deserve careful consideration. The problem is of importance, too, in every small city which would avoid the mistakes of the larger ones.

The Pro-Skyscraper Arguments

Let us frankly admit that there is something to be said for skyscrapers. The arguments in

* I. N. Phelps Stokes, in "The Iconography of Manhattan Island," Volume III, states that the Tower Building, erected in 1888-9 at 50 Broadway from the plans of Bradford Lee Gilbert, "was the earliest example of skeleton construction, in which the entire weight of walls and floors is borne by a framework or cage of steel columns and beams, which transmit the load to the foundations."

Stokes attributes the beginning of the skyscraper's development to the first years of this century. The Flatiron Building was put up in 1902; the Singer Building was begun in 1906 and finished in 1908; the Metropolitan Life Building was completed in 1909; the Woolworth, begun in 1910, was completed in 1913. The new Equitable Building was sent up in 1915.

favor of them may be summarized as follows:

1. High buildings which, in effect, mean the intensive use of property, are required in order to earn a fair income on high-priced property.

2. High buildings frequently give magnificent views of the surrounding country, and at the same time give the tenants the enjoyment of a maximum of light and air.

3. There is great convenience incident to concentration. Horizontal distance is converted into vertical, making, by reason of the rapidly moving elevator, for greater convenience.

4. A single office building forty stories high on one acre of land is no worse in respect to causing congestion than four office buildings of similar floor area each ten stories high—though this argument, of course, requires the further supposition that in the case of the forty-story building the other three acres shall remain vacant.

5. It is urged that a uniform height of building, or uniform cornice line, results in an uninteresting effect, that occasional high buildings lend an interest to the skyline and to the general appearance of the city.

The Arguments in Rebuttal

On the other hand, it must be recognized that the high building has placed a burden on the community which must be met and must be paid for. Taking up each of the contentions in favor of high buildings *seriatim*, it is urged in opposition that:

1. It is a real question as to whether high values of land compel high buildings, or the reverse. Apparently we have a vicious circle in which one can hardly say which is cause and which is effect.

2. High buildings give fine views only so long as they monopolize sky privileges, and even then only at the expense of others whose views are cut off.

3. Concentration spells congestion. Conceivably it might be convenient to conduct all a city's business activities under one roof, creating an enormous beehive of industry; but obviously such a plan, while having some merits of convenience, would be highly objectionable from many other points of view. In our larger cities buildings of thirty stories are common, and there are a few of forty, and of even fifty stories and more.

4. The trouble about permitting a single office building forty stories high, is obviously that one cannot prevent other similar types near-by, and that is why congestion soon results from a single skyscraper. For example, a forty-story building occupying an acre and accommodating conservatively 10,000 persons, is served usually by only one important artery of traffic. On the other hand, four ten-story buildings, each occupying an acre, would probably be served by more than one traffic route, and in any case would offer greater freedom of access.

5. In answer to the old argument that a uniform height of building, or uniform cornice line, is uninteresting, it may be said that, while this is sometimes true, it is certainly no more so than the irregular hodgepodge which we so often see. Compare, for example, the uniform treatment of the frontage of the Place Vendome in Paris with the usual frontage even of high-class buildings in any American city. Some day we shall learn that a reasonable harmony of design in architecture is as important as harmony in music.

Steps in the Development of High Buildings

The steps in the development of high buildings in any particular district are usually as follows: An owner finds that the market value of his lot has risen to a high point where his existing building (perhaps five stories high) yields but a poor return on the ground rental or the assessed value. He calculates that if he puts up a building fifteen, or twenty, or thirty stories in height, he will have more leasable space from which to collect the ground rent or taxes. By any one of several means he finances the construction, with the expected results. The immediate effect of this is to increase the potential and, therefore, market and taxable value of near-by property, and at once other property owners in the neighborhood are more or less forced to build into the air or find that their lots are being taxed more than they earn. In the end the first man's building no longer enjoys its early advantages in the way of light and air, and the streets of the neighborhood have become dark and congested. In some cases the impelling motive appears to be publicity, rather than profit on the building itself; the skyscraper serving to advertise, sometimes in a rather flamboyant way, the name and location of the concern which builds it.

When a number of owners have put up high buildings to cover their taxes, the following results must be expected, except where the city is growing extremely fast: (a) the increased supply of office space will reduce rentals for the owners of all the buildings, and accordingly reduce or wipe out their profits; or else, (b) the new skyscraper district will kill values in

SKYSCRAPER CONGESTION AT THE TIP OF MANHATTAN ISLAND, NEW YORK CITY

SIMILAR CONDITIONS DEVELOPING IN DOWN-TOWN PITTSBURGH

Photographs copyright Fairchild Aerial Surveys, Inc., New York

DETROIT'S SKYSCRAPER DISTRICT CREATES SERIOUS TRAFFIC CONGESTION IN THE AUTOMOBILE CITY

BALTIMORE ALSO IS PILING UP TROUBLE AS BIG BUILDINGS MULTIPLY IN A SMALL CENTRAL AREA

Photographs copyright Fairchild Aerial Surveys, Inc., New York

TALL BUILDINGS WITHOUT ADEQUATE SETTING ARE CHARACTERISTIC OF SAN FRANCISCO AS OF OTHER GREAT AMERICAN CITIES

WHEN DALLAS' 200,000 BECOMES A MILLION, WILL THIS CONDITION BE FIVE TIMES WORSE?

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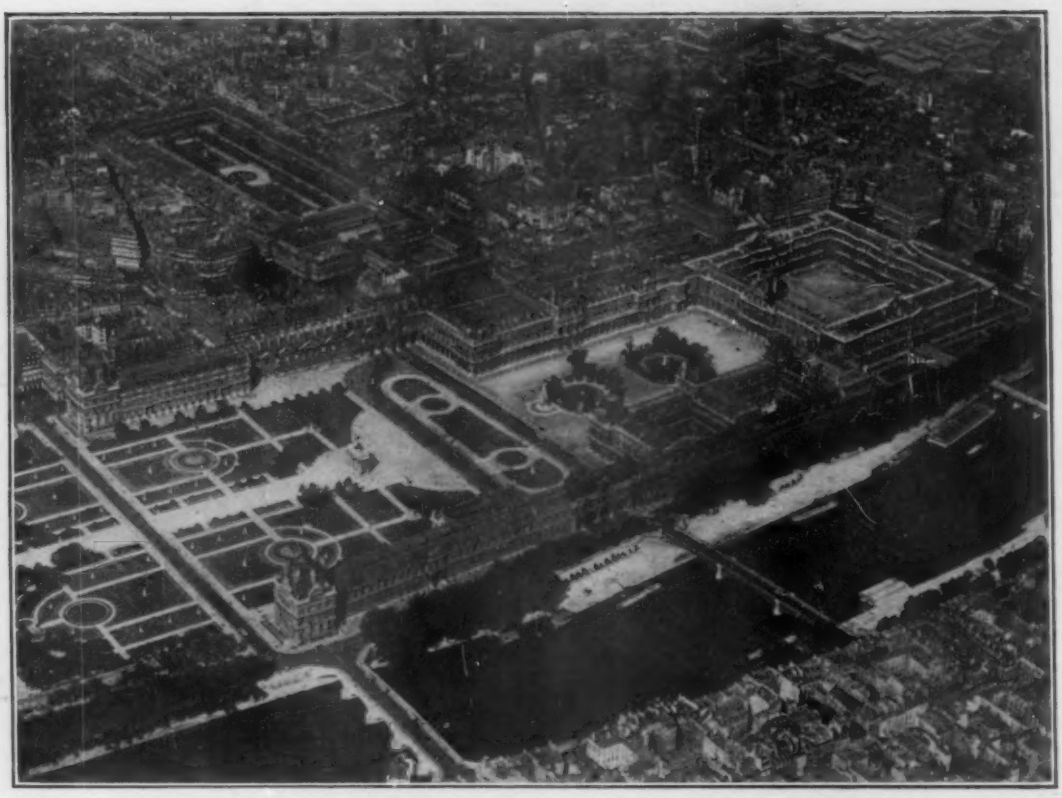


THE ALMOST UNIFORM SKYLINE AND WIDE OPEN SPACES OF PARIS
Photograph by Compagnie Aerienne Francaise; copyright Underwood & Underwood, New York

outlying office districts, resulting in zones of deteriorating value and obsolescent construction. Such zones have unfortunate indirect consequences. In New York, for instance, they are the homes of the sweated trades and of the industries which could not survive in the center if they had to pay real rents. In other words, these areas of deteriorating values delay the dispersal of small industries into the suburbs and satellite towns and become a new cause of congestion.

Relation of Building Heights to Street Widths

It is interesting to note that in the days when city planning was still a problem of two dimensions, it was assumed that about one-third of the total area occupied by a city must be given up to streets, open places, squares, or commons. As far back as the time of Leonardo da Vinci or of Sir Christopher Wren it was thought that buildings should not be higher than half the width of the street on which they were located. This meant that when the sun was 30 degrees above the horizon a building facing the sun would be bathed in sunlight. The city planners of the National Capital at Washington evidently had in mind adherence to this rule. They laid out their important avenues and streets 160 feet from building line to building line, and the less important streets 90 to 100 feet wide. This would have permitted, say, seven-story buildings on the wide avenues, and four-story buildings on the less important streets.

These wise rules have long been forgotten, however, and we have come more recently to the notion that buildings should be at least as high as the width of the street, which means that when the sun is 45 degrees above the horizon a house on the sunny side of the street, directly facing it, would be in full sunlight. This may be said to have been the common and general rule as late as thirty or forty years ago, but has yielded completely to the forward march of the skyscraper.

Community Costs of High Building Nuclei

If no other indictment could be placed against the skyscraper, the fact that it deprives a very large part of the community of sunlight is a serious one. Our forefathers, in their Declaration of Independence, esteemed as a privilege, which every one had the right to demand, "life, liberty and the pursuit of hap-

piness." Recent researches fully bear out the theory that the health-giving qualities of the sun play an important part in our health, our life, and, therefore, in our happiness; and we may find that, in giving to some the privilege of erecting buildings of exaggerated height, we have given a privilege which infringes on the limits of liberty because it denies health, and thereby life and happiness, to many others.

The high-building movement in New York and other cities has developed into what may be termed high-building nuclei. Often the effect is to depress the value of property a little distance from these nuclei; and it is frequently found that property is assessed in areas just outside the high-building centers considerably in excess of their rental or salable value. Simultaneously with this, the high buildings, while they have increased the market and taxable value of certain near-by property, have in an even greater ratio increased the requirements for street widening, or for such extreme measures in taking care of rapid transit facilities as have been found necessary in New York, Chicago, Philadelphia, or Boston—elevated roads, subways, and the like. And in this connection it need hardly be pointed out that the construction of elevated roads and subways is simply adopted as another way of enlarging the street capacity by double- or triple-decking rather than by horizontal widening.

Zoning

In the year 1916 a new and very important principle in city planning was adopted in our country, the principle of zoning property for certain uses; and, incidental to that principle, an effort has been made to apply limitations as to height. The principle of zoning has progressed favorably, but, as might be expected, its application must necessarily be somewhat cautious and gradual. We must feel our way. It would be easy to attempt to do so much in its application that the benefits gained would be destroyed, for it remains to be determined how far our courts will go in sustaining the "police power"—and this is especially true when this power is invoked to prevent the erection of excessively high buildings. On the one hand, there are those who, insisting on the enforcement of property rights, claim that a man has a right to do what he will with his own; whereas, others urge that the privilege of doing as one will with one's own is limited by the requirement that no one is privileged to make such a use of his own property as will do positive injury to his

WILL CHICAGO MAINTAIN THE FINE STANDARDS SET BY THE WRIGLEY BUILDING AND TRIBUNE TOWER IN THE NEW SKYSCRAPER DISTRICT NOW DEVELOPING OUTSIDE OF THE "LOOP"?

Photograph copyright Chicago Aerial Survey Co.

neighbor or the community at large.

Doubtless enough has been outlined in the foregoing to indicate that there is a very close relation between the privilege to owners of erecting high buildings, and the burden thrown upon the community of taking care of the consequences. If a man erects an office building which houses ten thousand people on an acre of land, it is obvious that he has thrown upon the community a burden which every one must help pay for. Furthermore, if a city is built with streets and other avenues of communication adequate only, say, to a construction of four- to six-story buildings, it cannot, without widening or double-decking those avenues of communication, take care of twice this burden.

When, in addition to these arguments, it is remembered that the high building, whether it be an office building, a hotel, an apartment house, or a department store, brings in its train not only a large population which must be cared for and transported, but also at once brings a demand for accommodations for loading, unloading, and storing (parking) motor cars, taxicabs, vans, and so forth, we begin to see that the cubage of buildings must have a definite relation to the number and the width of the public streets. The zoning of street frontage for particular uses must go hand in hand with the regulation of traffic in the streets, and must be done under the police power fairly, and so as not to let any one for a price do something that is in effect detrimental to the neighborhood.

What Is the Answer?

On the face of it, it would seem:

First, that every city must plan for some fixed basis of maximum of population per acre that will be cared for in each of its several zones.

Second, it must determine what average height of buildings will be necessary to maintain such a population without interference with the interests of the community at large. Having made this determination, it should then let property owners be free to build substantially as they wish on their own property, provided only that this average is maintained.

For example, if five stories were the normal limit, the property owner who wished to put up a ten-story building, would be privileged to occupy only one-half the area of his lot, or make corresponding setbacks giving the same net results. If he wished to erect a twenty-story building, he could occupy only one-fourth of his lot, and so on.

If, instead of this sort of limitation, a city prefers to allow high buildings to be built regardless of such an average requirement, it must, by means of zoning for use, coupled with taxation, place a tax burden on the high buildings which shall be in some way commensurate with the burden that is thrown upon the entire community.

As illustrative of this burden, the case may be cited of an office building erected in New York on lower Broadway ten years ago, the day-population of which is upwards of ten thousand arriving in the morning and leaving in the evening, sufficient to monopolize the entire capacity of the nearest subway station for forty-five minutes. Since then other high buildings have been constructed and two additional subways have been opened. In spite of it all, the facilities are still inadequate.

Summarizing Our Findings, We Note That:

(1) High buildings cut off the benefit of sunlight for neighboring property;

(2) They add to the traffic burden on the streets, necessitating expensive expedients, such as street widening, or double-decking in subway or elevated, or both;

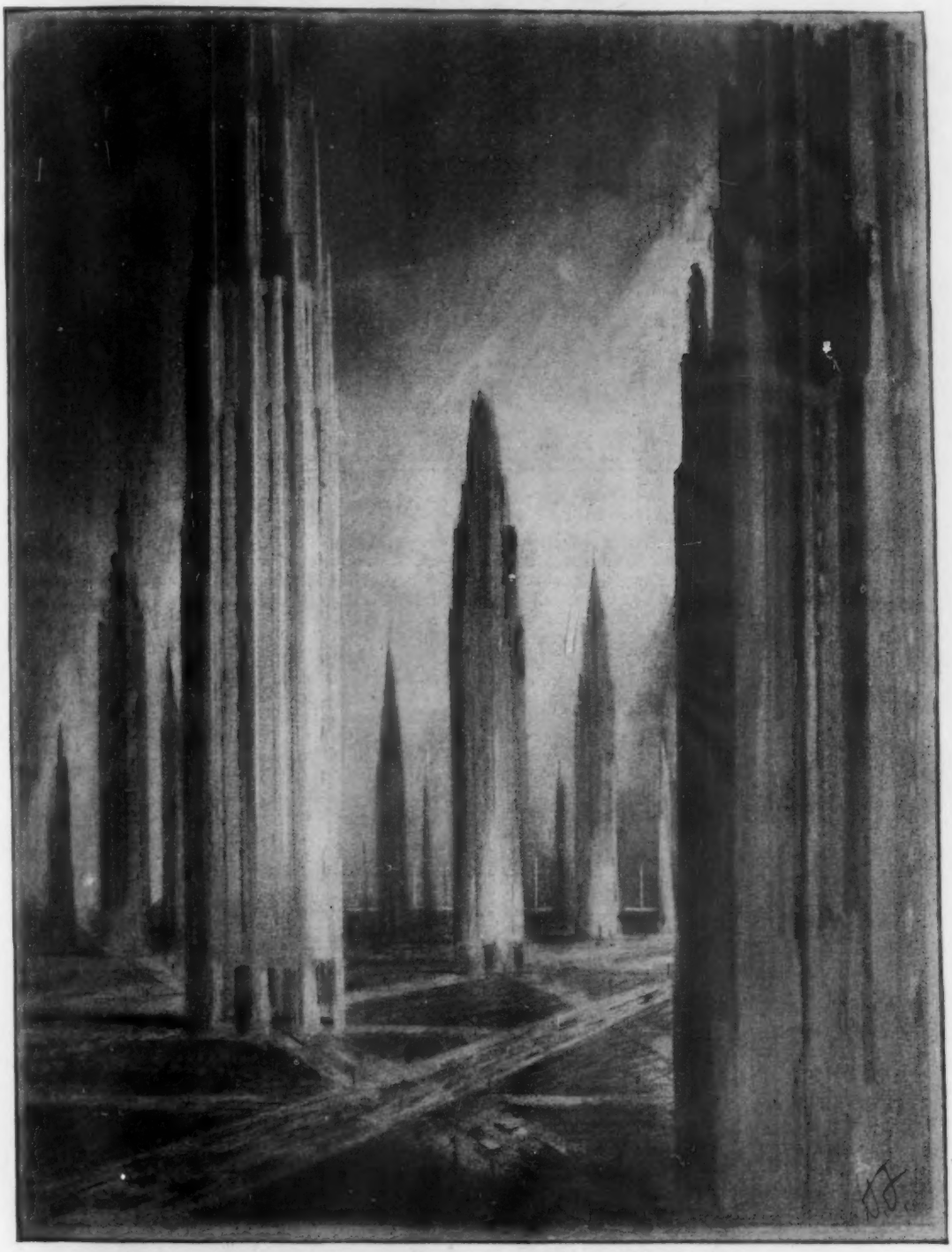
(3) Under our method of taxing property on the basis of potential value rather than for the use actually made of it, every high building exerts a potent and often a compelling influence on neighboring property owners to build high buildings;

(4) High buildings, if not too frequent and if provided with sufficient area about them for light and air, are not only not objectionable, but add individuality to a city.

We are inevitably drawn to the conclusion that the average height cubage or population capacity of buildings must be limited to the feasible capacity of the arterial street system; and that if exceptions are to be made permitting very high buildings in certain areas, a tax must be put on the added height commensurate with the added burden thrown on the community.

No reference has been made to the enhanced public danger incident to earthquakes, even though the scientists tell us that no section of the country is immune from such a possibility; but even without this it is believed that enough has been said to arouse public attention to the seriousness of the question. European countries, with far greater average density of population and far more reason to heed the congestion argument, have thus far not adopted the American idea of the skyscraper; and we

should do well to "Stop, Look and Listen" before it is too late. There is no phase of city planning to-day which is more important, and it is high time that we arouse ourselves from our lethargy and deal with the subject wisely and courageously.



From the drawing by Hugh Ferriss, New York, based on a proposal of Raymond Hood, Architect

APPEARANCE OF AN IMAGINARY CITY IN WHICH BUILDINGS ARE CARRIED TO EXTREME HEIGHTS ON SMALL PLOTS, THE LARGE AREAS REMAINING BEING GIVEN OVER TO TRAFFIC AND PARKS
The well-planned city of the future may scatter beautifully designed and well-placed sky-scrapers like these among lower buildings and open spaces such as are shown in the Paris picture on page 6

Asphalt Paving Plant Inspection

By W. J. Emmons

Highway Research Specialist, U. S. Bureau of Public Roads

THE proposition that successful construction depends equally upon adequate specifications and on faithful execution surely requires no demonstration. Nevertheless, in the case of asphaltic pavements it is not uncommon to meet public officials and even engineers who feel that the contractor, under nominal supervision, may be safely entrusted with the preparation of the mixture and that the expenditure of a part of the generally limited paving fund for inspection is not justifiable.

There are several good reasons why competent inspection is essential and should be provided for in the specifications. The contractor is ordinarily a contractor only and not a paving technologist. He is primarily interested in the operation of his plant and in sustained maximum production. He desires quality certainly, but he also is eager to make a profit and his interests are inherently opposed to many of the refinements which are essential to best results. Perhaps the continued existence in some localties of the maintenance clause is in recognition of these facts. If so, it is certainly a less scientific, economic and certain method of attempting to insure satisfactory construction.

How to Improve Asphalt Paving

Three lines of endeavor are open to those who seek improvement in the quality of asphaltic pavements: first, that leading to more intelligent design through research in the properties of materials and their combinations; second, that having as its object more careful regulation of the preparation of the paving mixtures; third, that pointing the way to better construction methods. The present paper deals with the second line, which, although it perhaps does not offer the alluring opportunity for research and discovery presented by the others, does undoubtedly play an important part in obtaining proper construction.

Inspector Lessens Contractor's Worry

From the contractor's standpoint the presence of an inspector should be and generally is regarded as welcome assistance rather than an additional worry and burden. A competent inspector is often able to work out satisfactory combinations of aggregates which individually fail to meet specification requirements, thus saving the contractor considerable financial loss. Most important of all, however, is his relief from responsibility for the quality of the mixture, which under the inspection plan should be definitely assumed by the engineer.

In delegating authority to the plant inspector, the rights of the contractor to operate his plant and organization in his own way should be clearly recognized. There should be no interference on the part of the engineer's representative in any matter not influencing the quality of the product. He should possess authority to pass upon the suitability of materials, to direct the processes of proportioning and mixing, and to obtain, through the contractor, assignment of laborers competent to perform these latter duties under his immediate supervision. A word of warning is in order, however, lest the contractor, noting the interest of the inspector, attempt to delegate to him for limited periods full charge of the plant. This is going too far in the matter of rendering assistance, as it relieves the contractor of responsibilities which only he may properly carry.

Inspection of Plant

Many duties await the inspector upon his arrival at the plant. The plant itself should be examined, with special reference to the proportioning apparatus. Specifications preferably and generally require that all materials shall be weighed, but scales sometimes get out of order and result in troublesome variations in proportioning which are very difficult to locate. Consequently, both the asphalt and the aggregate scales must be checked by means of test weights or sacks of aggregate previously weighed upon any available scale of known accuracy. The bins and screens also should be examined for breaks, mixer paddles for length, and, in general, the inspector should familiarize himself with the condition and operation of the plant.

Checking Sources of Supply

As there is no time for detailed tests at the

paving plant, it is necessary that sources of supply be approved before any materials are ordered by the contractor. Then, as shipments arrive, they should be examined for conformity with the governing specifications. In general, no test other than the penetration test for consistency can be made upon the asphaltic cement at the paving plant. With the consistency ordered to fall within 10-point limits, as is becoming the practice, this test is merely a check upon the grade supplied by the refinery. Should asphalt requiring fluxing be used, the test assumes greater importance and becomes a means of determining the proportions of refined asphalt and flux to be used and constitutes an essential check upon the thoroughness of combination.

Observation of results over a period of years as well as the results of certain service tests lead to the conviction that the consistency of the asphaltic cement may prove to be a considerably less important factor in the behavior of asphaltic pavements than has been believed. Test pavements of asphaltic concrete laid and subjected to traffic by the Bureau of Public Roads at the Arlington, Va., outdoor laboratory, included satisfactory sections containing asphaltic cements of 45, 55, 65, and 75 penetration, although it is true that those with the hardest asphalt were as a whole more stable. In a series of sheet asphalts laid upon the same location, there proved to be little, if any, difference between the behavior of a section mixed with 31 penetration and another with 55 penetration asphaltic cement.

Sieve analyses for gradation should be made upon the dust, sand, and coarse aggregates, and, if possible, this work should be done before shipments are unloaded. It is vitally essential, if uniformity of the mixture is to be obtained, that aggregates of dissimilar grading characteristics be stocked in clearly defined separate piles. Based upon materials at hand and preferably predicated upon previous laboratory tests, a formula for the mixture must at this point be worked out. When this is done, the plant may begin operation.

Watching Plant Operation

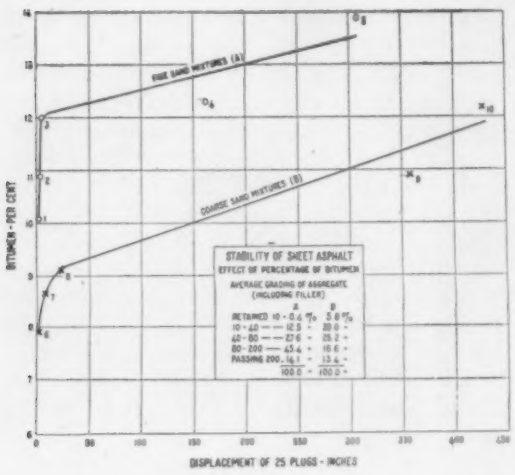
During the period of plant operation the inspector should station himself in such a position that he can watch every detail of proportioning. With most plant arrangements this point of vantage is the mixing platform, from which may be observed the weighing of the asphaltic cement and the aggregates, the measurement of dust, the temperature of materials, and the feeding of the cold materials. Periodic sieve tests of the hot aggregates are sometimes required of inspectors, and, although these are desirable as records, careful preliminary tests from the stock piles should give all necessary working information and eliminate the danger of irregularities which may occur unobserved while the inspector is away from the immediate scene of operations.

Asphaltic mixtures are unstable when they carry an excessive amount of bitumen, and it is felt that the regulation of the bitumen content is the most important single detail under the control of the inspector. With constant feeding of uniform aggregates, variations in weights of asphaltic cement may occur through carelessness on the part of the laborer entrusted with this detail. Variations may also occur at the beginning of the day's work or when, after delays, the asphaltic cement bucket is cold. At such times the bucket may retain sufficient of the weighed amount to cause a decided deficiency in the mixture. Should the weights be adjusted and more asphalt weighed to counteract this tendency, later batches will be rich unless further readjustment is made as the bucket is heated.

Improper feeding of cold aggregates, when two or more materials are being combined, will result in a non-uniform mixture. This may prove harmful by unbalancing the aggregate combination, but it is believed that the effect upon the bitumen content is even more serious. With the same weight of asphaltic cement, greater fineness will result in lean mixtures, and a decrease in fine sizes will render the mixture rich. If an asphaltic concrete is being prepared in a single bin plant, particular care must be taken to feed uniformly and accurately all of the materials, or variations such as occur with poorly proportioned sands will result.

As an illustration, assume that a mineral aggregate mix consisting of equal parts of stone and sand is being run. The stone will carry possibly 2 per cent bitumen, the sand may carry 10 per cent, and the mixture then should carry 6.2 per cent bitumen. If a batch is weighed correctly in total amount but irregular feeding has resulted in an aggregate containing 60 per cent stone and 40 per cent sand, the mix should carry 5.3 per cent bitumen. If the batch is actually mixed with the formula percentage of bitumen, it would then be rich by 0.9 per cent. It is the presence or absence of such inconsistencies that make the difference between success and failure.

Sheet asphalt test pavements recently constructed and tested under traffic by the Bureau of Public Roads illustrate most effec-


BITUMEN - PER CENT
DISPLACEMENT OF 25 PLUGS - INCHES
FINE SAND MIXTURES (A)
COARSE SAND MIXTURES (B)
STABILITY OF SHEET ASPHALT
EFFECT OF PERCENTAGE OF BITUMEN
AVERAGE GRADING OF AGGREGATE
(INCLUDING FILLER)
A
B
RETAINED 10 - 0.4 % 5.8 %
10 - 40 — 12.5 - 33.0 -
40 - 80 — 27.6 - 25.2 -
80 - 200 — 45.4 - 16.6 -
PASSING 200 - 14.1 - 13.4 -
100.0 - 100.0 -

tively the danger of excessive bitumen. Plugs placed in the pavement on white lines across the lines of traffic provided a means of measuring the longitudinal displacement of the mixtures.

The diagram shows in graphic form the behavior of two series of sections, one with a fine and the other with a coarse sand, each with a variation of the bitumen content within wide limits. Suppose an aggregate composed of equal parts of fine and coarse sand here illustrated is being used. It is probable that such a sand would carry about 10 per cent of bitumen, and failure of the organization to feed fine sand for a few minutes would result in an aggregate of the composition of sand *B*, which, when combined with 10 per cent bitumen, would be almost sure to displace badly under traffic.

To prevent such occurrences, requires alertness on the part of the inspector. Batches of aggregate showing lack of uniformity should be discarded without hesitation, as should also those to which an excess of bitumen has been added. The old practice of throwing in an additional quantity of dust to compensate for excess bitumen is dangerous and should not be permitted.

The Pat Test

Until a laboratory test properly correlated with service behavior of mixtures is devised, no method better than application of the familiar pat test can be suggested to determine when the proper amount of asphaltic cement is present in sheet asphalt mixtures. This simple test has its weaknesses but can be made quickly, and in the hands of an experienced man may be depended upon to maintain a uniform mixture. It is believed that the stain should be very light, particularly if heavy traffic is to be borne by the pavement. The pat test is, of course, not applicable to asphaltic concretes, and maintenance of a fixed percentage of asphalt in types containing coarse aggregate is possible only through trained visual inspection.

Temperature of Mixing

Recently there has been a tendency to permit considerably higher temperatures of mixing than was formerly the case. It is probably true that in this manner a more uniform distribution can be obtained, particularly with the leaner and higher filler mixtures which are now being advocated. It is likely that the asphaltic cement is hardened to a certain degree, and this, of course, may be harmful if extreme temperatures or if asphaltic cements of great susceptibility are employed. The extent of hardening with a given asphaltic cement cannot be accurately determined at the present time, as a satisfactory method of recovering asphalt from pavement mixtures has not been devised. Observation has indicated that 375° F. is very likely a safe temperature for sheet asphalt. Quite a different condition holds with asphaltic concrete, as it is desirable for the stone to carry a coating of the sand mortar when it leaves the plant. This condition somewhat counteracts the tendency toward segregation of the coarse particles in raking on the street and thus results in greater uniformity of construction. At temperatures around 325° F. the sand mortar tends to leave the surface of the stone, and consequently it would appear preferable to use this figure as a maximum working limit.

In this discussion no attempt has been made to outline a working program or to enumerate all of the details included in the procedure of plant inspection. It has, however, been attempted to indicate the extreme desirability for such supervision and to emphasize certain high lights which are of paramount importance in securing durable construction.

ACKNOWLEDGMENT.—From a paper presented at the Fourth Asphalt Paving Conference.

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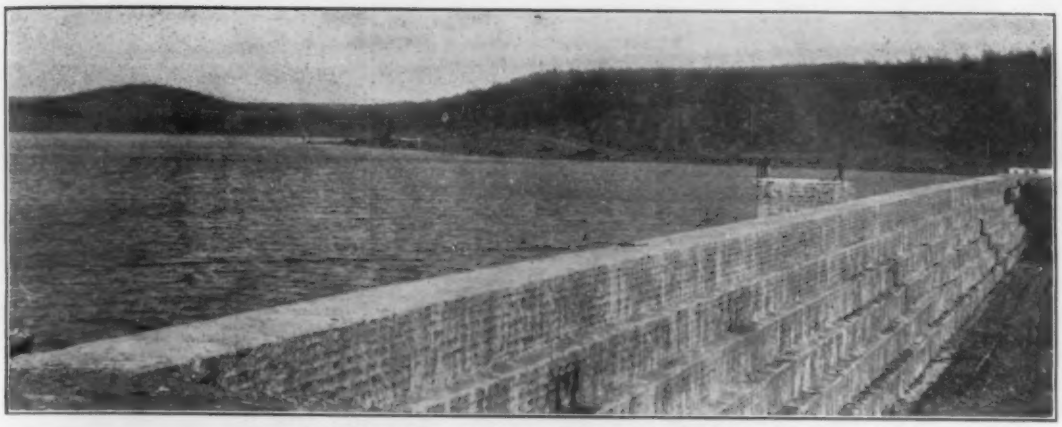


DAM OF NEW McALESTER WATER-SUPPLY

New Water-Supply of McAlester, Oklahoma

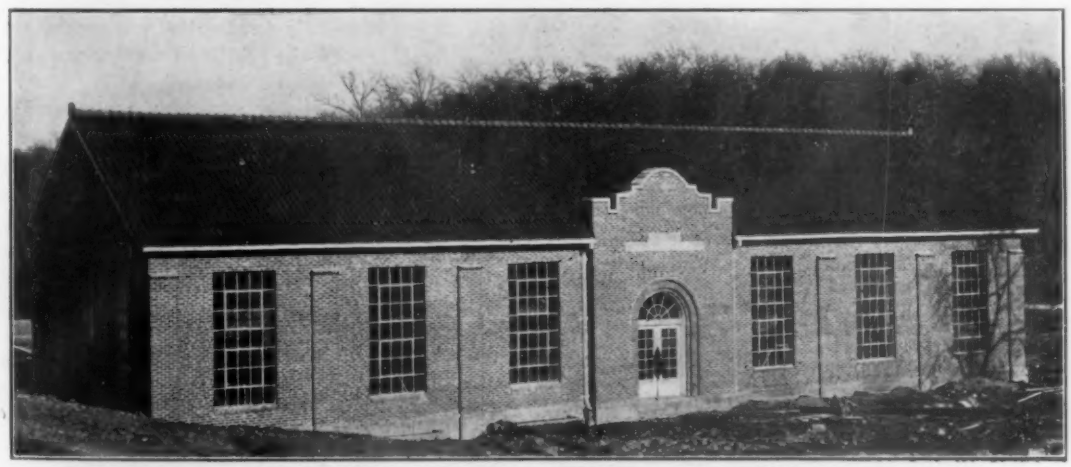
Ten Million Gallons of Water Now Available for City Supply

By E. T. Archer
Consulting Engineer, Kansas City, Mo.

WITH the completion of the 24-inch flow line between the new filtration plant and Lake McHoma, the city of McAlester, Okla., is now enjoying the fruits of its labor in securing a new water-supply. Now, when the fire-bells ring and the hose is attached, the citizens can feel protected, knowing that there are ten billion gallons of water available to extinguish the blaze.

McAlester lies in the coal country and is obliged to depend on surface water for the city supply. The amount of water in Lakes 1 and 2 proving inadequate, the city was forced to look for a site for a larger lake. What is now Lake McHoma was selected. Here a dam 900 feet long by 60 feet high impounds a lake 5 miles long and over a mile wide, with a shore line 22 miles long and containing enough water to supply the city of London, England, for over a year.

The spillway of the dam is at elevation 617, which is about 17 feet above the floor line of the filter building. Should the lake be full, this would furnish a gravity supply of ten million gallons per day, and under average conditions a supply of six million gallons per



EXTERIOR OF THE NEW McALESTER FILTER PLANT

day can be readily secured. However, in order to provide against times of extreme low water, a low-lift pump is installed.

The filtration plant, to which the water is conveyed by a 24-inch cast iron pipe, rests in a depression immediately in front of the dam retaining the water in Lake 2. The location of the plant was influenced by a desire to secure a gravity flow from all three lakes and yet have the plant at a sufficient height so that it would not be flooded by high water—which has been known to rise to elevation 598. The filtration plant proper consists of the mixing chamber, chemical storage room, settling basins, filters, clear well, and high-lift pump room, and no effort was spared on the tion walls were waterproofed throughout and areaways built up around the windows inserted for the purpose of light and ventilation, thus preventing the seepage of surface water into the pipe gallery.

Another novel feature in the plant is the location of the clear well, which occupies a space under the floor of the filters and pipe gallery. In order to secure additional storage, the water rises under the filters to a plane above the level of the pipe gallery, thus causing an upward thrust against this floor of the gallery, to provide against which double reinforcing was necessary.

The pumps, of which there are two, are of the outside-packed duplex electric-driven type,

INTERIOR OF FILTER PLANT, SHOWING CONTROLLERS

part of the city to secure a modern installation.

The settling basins are of concrete and are designed for a consumption of 4,000,000 gallons per day on the basis of a six-hour retention period. The mixing chamber and filters are also built of concrete, and are amply able to handle this capacity.

The building itself is tapestry brick resting on a concrete foundation and surmounted by a red tile roof. It is about 40 by 80 feet in outside dimensions, and gives all the floor space needed for the operation of the plant.

As the operating floor of the filtration plant is only two feet above the high-water line, it was necessary to introduce some unusual features in the construction of that part of the building below the ground level. The founda-

each having a capacity of two million gallons per day. Power is available for their operation both from the State Penitentiary and from the local power company.

In order to secure additional storage and to equalize the pressure over the city, a two-million-gallon concrete reservoir is provided about half-way between the plant and the town. This is supplied through a 12-inch line directly from the plant, and a 14-inch line that skirts Lake 1 and thence connects to the old pressure line to town, a 14-inch cross-connection being provided to the reservoir. When this reservoir is full, it supplies the city through a 12-inch line direct to the present stand-pipe, and also through the 14-inch cross-connection to the entire distributing system of McAlester.

Thinner Brick Pavements in Street and Highway Paving

By Webster L. Benham
Consulting Engineer, Kansas City, Mo.

OF the three outstanding points of interest in the consideration of vitrified brick pavements to-day, namely, first, unusual and unique salvage in old brick surfaces, second, the wide and almost universal adoption of pure asphaltic cement for filler, and, third, the rapid increase in the use of brick of less than 3 inches in depth on light- and medium-traffic streets and highways, the latter is perhaps of the most interest from the standpoint of design.

It is the writer's opinion that for many years engineers have specified 3-, 3½-, and 4-inch brick on light-traffic streets, where a thinner brick, of perhaps 2½ inches, would have served just as satisfactorily, effecting a considerable saving to taxpayers. It must be borne in mind that the cost factor in the construction of highways and street pavements is becoming a more and more important item as time goes on, and that henceforth the taxpayers will investigate costs of pavements with a view to obtaining something having qualities of durability and "wearability" at a reduced cost.

There was, of course, one very good reason for the heavy design of the paving wearing surface in years past. The pronounced abrasive wear due to steel-tire traffic and iron-shod horses made it necessary to construct pavement to withstand heavy impact and wear. The change in the character of traffic during the last decade, however, has largely nullified this reason so far as present or probable future design of the brick wearing surface is concerned.

Although many of the brick pavements of the past have been constructed with almost total disregard of proper engineering principles, as we recognize them to-day, these pavements have demonstrated certain virtues in spite of this fact and have uniformly maintained a high standard of quality regardless of such neglect.

It is perhaps needless to point out here that the virtues inherent in our older brick pavements have been due to the toughness and wearing qualities of the bricks themselves rather than to any special virtues in the other component parts of which a pavement is constructed, such as the subgrade, foundation, cushion, or filler. This important truth is borne out in instances too numerous to mention, and despite the lack of attention to the subgrade, the evenness of the surface of the foundation course, the thickness and evenness of the sand or mortar cushion, the type of filler, and the almost total lack of maintenance, brick pavement has, as a rule, demonstrated unusual merits.

ROLLING THE U. S. BUREAU OF PUBLIC ROADS' TEST PAVEMENT OF BRICKS THINNER THAN STANDARD

Early Construction Methods Inefficient

It is universally conceded that early methods of construction were far from efficient. However, it is desired to emphasize that, in spite of the absence of any special study of the subgrade, adequate foundations, or artificial base, in spite of poor drainage and lack of attention to the many important factors which tend to make a first-class pavement, in spite of the ever increasing volume of traffic, the brick wearing surface in scores of ancient brick pavements has demonstrated a strength and durability far beyond any reasonable expectation. Each individual brick in those

anciently designed pavements, although poorly and irregularly supported, has rendered service which suggests that the brick themselves have a durability extending beyond the other component parts of the pavement structure, and that in many cases a thinner brick than that used would have served satisfactorily, and possibiy more economically.

Sand-filled brick pavements that have been down for as long as thirty-three years, on gravel base, with no artificial drainage, and subjected to frequent cutting for all sub-surface structures, have been taken up and relaid on renewed base courses, the brick seemingly good enough for another generation of use. These instances have been so numerous during the last few years that the procedure is no longer an experiment, and is accepted paving practice, constituting a unique economy.

Heavier Traffic and Thinner Brick Not Incompatible

It sounds paradoxical, but it is nevertheless a fact, that with traffic becoming heavier year after year, more and more engineers are adopting 2½-inch brick, and in some cases 2¼-inch brick, for the wearing surfaces on light- and medium-traffic streets. At first glance this might seem incongruous, but a little consideration of the reasons why reveals a sound basis of engineering reasoning underlying such change.

The change in traffic in the last ten or fifteen years has brought about an increase in the static weight, greater intensity, greater impact where impact occurs, but after all a decidedly less abrasive wear, except perhaps when tire chains are used. Given anything like a proper support, there has never been any question about a vitrified brick's withstanding the static load. In fact, a vitrified brick would have to be thinner than 2½ inches to be crushed under any static load it would be called upon to carry in the surface of a pavement. As for greater impact, it is pointed out that all types of pavements are being constructed much smoother than in bygone days. In the case of brick pavements, engineers are now insisting on base courses having a true and smooth surface. Also, they are demanding that greater care be exercised in the proper application of the sand bedding course, guarding particularly against too thick a bed and lack of uniformity in its compaction.

A Stable Subgrade Necessary

One very important factor is often overlooked in the design and construction of pavements. We refer specifically to the subgrade. Unless the subgrade is maintained with a great degree of stability, the pavement will suffer to small or large degree, depending upon conditions. Stability can in most cases be obtained by proper drainage for the reduction of capillary moisture, and if this is accomplished, the cost of the foundation can often be reduced by using a thinner section of concrete for the base, or "non-rigid," or flexible types of bases, such as macadam, rolled stone, gravel, or "black base" may be used.

One of the greatest fields for the practice of economy in the development and construction of pavements is in the proper treatment of the subgrade. Brick pavements have suffered perhaps as much, if not more, on account of lack of attention to the subgrade and foundation, than any other class of layer or course pavements.

Surface Resists Abrasion—Subgrade Carries the Load

The principal occasion for the specification of heavy brick has been when it was thought necessary to overcome abrasive wear. The rubber tire has made this item almost negligible, and to-day, according to the testimony of many engineers, we find the 2½-inch brick, and in a few instances the 2¼-inch brick, carrying modern traffic and withstanding this traffic seemingly as well as heavier neighboring brick surfaces. In the early days of street and highway paving, traffic was lighter and the principal aim was to lift communities out of the mud. More often than not, vitrified brick paving was looked upon as comprising the entire pavement structure and was so used. Occasionally, there was a foundation specially prepared of gravel, sand, or even planks. At times a two-course construction was specified in which a layer of common brick was put down, a sand bedding course applied, and the brick laid thereon. As traffic increased in weight and intensity, the first change to take place was toward a more substantial artificial base, except in those sections where sandy or gravelly subsoil provided speedy and perfect natural drainage. There followed a period during which attention was centered on designing artificial durability to carry the loads. The outstanding exception to this perhaps has been in Florida, where it has been and is now common practice and considered good engineering design by the engineers in that locality to lay the brick on the compacted sand soil.

Later it became more and more apparent to

municipal and highway engineers, at least to a certain large school of engineers in municipal and highway practice, that in the last analysis the weight of traffic had to be carried by the subgrade. Dry and stable subgrades never failed to carry the load satisfactorily. All that was needed on such a subgrade was a surface that would resist abrasion and could conform to subgrade movement. This centered attention more on efforts to stabilize subsoils. Research in drainage followed, and the result to-day is that there are a very large number of highway engineers that rightfully believe pavement design should start with careful consideration of subsoil conditions and characteristics.

After everything possible has been done to stabilize the subgrade with suitable drainage, or the admixture of coarse materials to reduce capillary moisture, in many instances artificial bases of comparatively inexpensive material may be found sufficient, provided this base is protected with a wearing surface that will stand whatever abrasive wear there is, and that will transmit the weight and impact to the base, and in turn to the subsoil.

With this development in engineering thought, has gradually developed the viewpoint that a vitrified paving brick wearing surface of 3, 3½, or even 4 inches, is in many cases unnecessarily thick, heavy, and needlessly expensive under present-day traffic, particularly in residential and light-traffic streets and roads, and especially where proper attention has been paid to other vital features of pavement design.

The Economy of Thinner Brick

It hardly need be pointed out that in those cases where a thinner brick is altogether sufficient, engineers would be doing a distinct public service by saving property owners and taxpayers the extra cost of unnecessarily heavy brick. As to the brick themselves, the 2½-inch paving brick are made identically with the same materials, either shale or fireclay, as the 3, 3½-, and 4-inch brick with which we are more familiar. Practice and experience have demonstrated that plain, wire-cut, vertical fiber, lugless brick is the most all-around desirable and satisfactory type for the present-day construction. The 2½-inch brick are of this type. Because of their smaller size and lighter weight, they are more easily handled, not only in the manufacturing operations, but in the actual laying of them in the pavement. The brick conform in every respect in their manufacture to the larger and heavier types, the only point of difference being in the one dimension of depth. The setting and burning operations are, of course, regulated by the manufacturer to provide the proper amount of heat to insure vitrification identical with the larger brick.

The rapid increase in the use of thinner brick can be measured by the fact that, whereas only 6,862,565 of the 2½-inch brick size were used in 1920, there was a total of 17,542,786 brick of 2½-inch size and 2¼-inch laid in 1924.

During the last twelve years several million yards of 2½-inch vertical fiber plain wire-cut brick have been laid in Kansas, Oklahoma, Arkansas, Louisiana, Texas, Mississippi, and other southern and western states. Asphalt filler is used, and the artificial base, where it is necessary, has ranged from 4 to 5 inches in depth. A recent survey showed all these pavements in satisfactory condition, with the exception of two streets in Oklahoma City where the artificial base gave way and allowed the brick to settle. The use of the thinner-section brick in the states above mentioned would indicate that this type of construction is giving satisfaction even in the oil fields, where traffic is exceedingly heavy.

Recommendations for Use of Thinner Brick

The following recommendations comprise the opinions of numerous engineers who have been specifying 2½-inch brick during the last fourteen years.

Careful study should be made of the subsoil and subgrade conditions and proper drainage effected if necessary so as to reduce the percentage of capillary moisture. It is important that the base course, of whatever material, be of as nearly perfect alignment as possible; that is, the surface should be smooth, with no protruding stones extending above the general contour. This, of course, is true of the construction of brick pavements of whatever thickness, but more particular care should be taken wherever thinner-section brick is used. Protruding stones comprising the coarse aggregate in a concrete base should be wholly avoided. The best way to insure a smooth and even surface is to float the concrete base. In the case of crushed stone, crushed slag, or gravel bases, care must be taken to secure a thorough and even compaction as well as an even surface.

Asphalt filler should be used without exception. The sand bedding course should not exceed one inch in thickness, and it is generally conceded that a three-ton self-propelled

roller is sufficiently heavy, although five-ton rollers have been used on occasion. Since the three-ton roller is sufficiently heavy to properly bed the brick in the sand, there is nothing to be gained by using a heavier roller, and the heavier roller might even be used to the detriment of the pavement. The use of the lighter roller will obviate the "shoving" that sometimes takes place with brick of any thickness when the sand in the bedding course is large-grained.

After the brick have been properly incorporated in the pavement, there is no reason why there should be any breakage under the heavier traffic.

ACKNOWLEDGMENT.—From a paper read at the 31st Annual Convention of the American Society for Municipal Improvements.

A Summary of Snow-Removal Methods

SNOW-REMOVAL methods are divided roughly into three classifications—those employed on western and mountain roads, on eastern, middle western and Canadian highways, and in cities. There are certain rules, however, on which practically all authorities are agreed. These may be summarized as follows:

1. There must be some central responsible authority to whom the entire organization will look for instructions and leadership, such as (a) the maintenance division of the State Highway Department, (b) a county road official, and (c) a street department.

2. The organization must be capable, physically efficient, well-trained, self-reliant, and imbued with the determined spirit of battle. Each individual should have a definite assignment.

3. The territory must be intelligently divided, and each division must have its quota of men. There should be a "lieutenant" in charge of each division.

4. Men and machinery must be ready to begin work on short notice and to work at top speed night and day in emergencies. Therefore, the organization should possess reserve forces, sufficient for relief when necessary.

5. Mechanical equipment, tractors, snow-plows, etc., should be kept in warm storage to facilitate quick starting and be overhauled in advance so as to be ready for immediate use. Spare parts should be conveniently at hand.

6. A definite program for all phases of the work should be laid out in advance, preferably in summer and fall, and each division commander should be familiar with all details.

7. The organization must possess an intelligence department, which must at all times keep each division in touch with the others and with headquarters, and which must keep informed as to weather conditions. This department may make use of telephone, telegraph, radio, and mail, receiving the cooperation of the U. S. Weather Bureau, which is rendered free of charge.

8. Work should be commenced as soon as the snow begins to fall and continue without interruption until the roads or streets are cleared. The general practice in road work is to begin plowing before the precipitation has exceeded three inches. An exception is where extremely heavy snowfall occurs in a very short period.

9. As great a width of highway as possible should be cleared, because there is less likelihood of damage to the roadway from freezing and heaving, and the work of plowing is rendered less difficult later in the season if the early snowfall is pushed well back. Also, less packing occurs from traffic. Some officials prefer to clear the center of the roadway during the storm and then push the snow back further after the storm has ceased.

10. The surface of the road should be left clean, except in cases where it is necessary to provide for sleighing.

11. Ditches and drains must be kept open. As soon as the road is cleared, shovelers should be put to work clearing culverts and cutting openings to side ditches.

12. Arrangements should be made for paying promptly in cash any extra labor employed.

13. The battle against snow is on in earnest. The public no longer accepts the burden of snow as inevitable. With powerful tractors as power units for sturdy snow-plows and the will to keep the roads open in winter, the weapon is at hand to establish effectively the new era of free winter travel in the snow belt, according to "The Snow Removal Book" published by the Caterpillar Tractor Company, San Leandro, Calif.

LAND AREAS OF AMERICAN CITIES

From inquiries which have recently been received by The American City, it would appear not to be generally known that information as to the land areas in acres of all cities in the United States having 8,000 or more population is given in a pamphlet issued by the Bureau of the Census entitled "Estimates of Population of the United States by States and Cities, 1910 to 1923 and Area July 1, 1922.

Similar information for 1923 for cities having a population of over 30,000 is obtainable from the Census Bureau's bound volume of "Financial Statistics of Cities" for that year published in 1925.

These publications are obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents and $1, respectively.

The Street-Cleaning Equipment of Denver

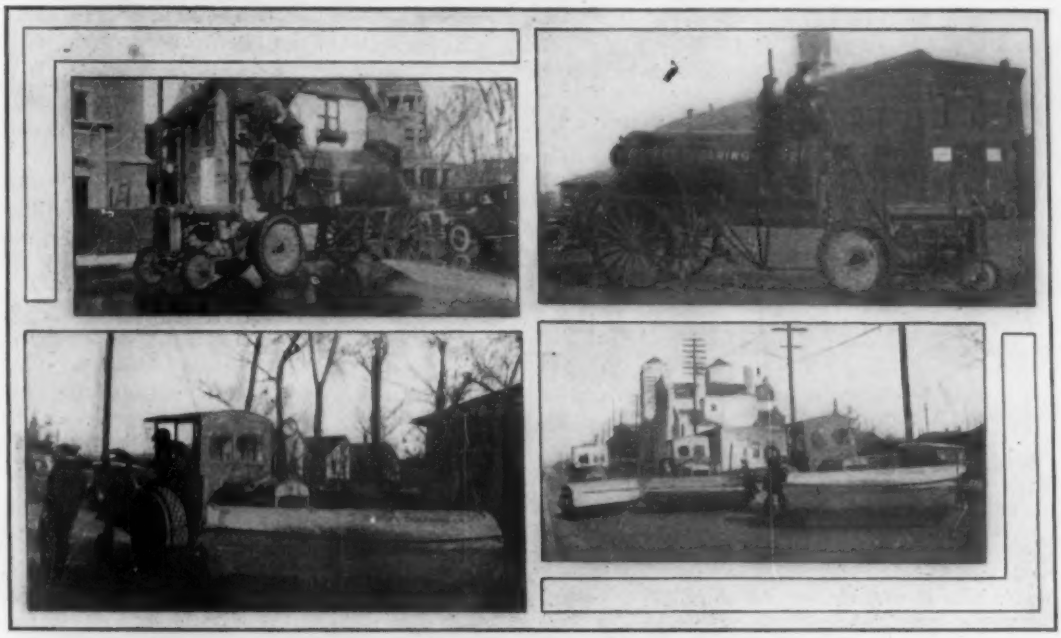
Capital City Adapts Old Horse-drawn Equipment to Use with Fordsons

WITHIN the last two years wages of labor in Denver increased from four to five dollars a day and team hire from eight to ten dollars a day. This advance caused the Superintendent of Streets, F. J. Altvater, with his efficient assistants, to begin the development of the present Fordson-hauled equipment, which includes dump-wagons, sweepers, pick-up sweepers, and flushers.

Street Sweeping

The street sweeper which has been designed by the Street Department and built by the city, except for the castings which are made at a local foundry, has an 8-foot broom mounted in front of a Fordson tractor. Two steel I-beams are hung beneath the tractor just inside the wheels to carry the broom and its curved metal and canvas cover. This hood can be quickly turned back to permit examination or replacement of the broom. The 8-foot broom is driven by a very short chain which is actuated by a newly designed shaft-drive direct from the Fordson power take-off. A 150-gallon tank mounted on two large casters is hauled immediately behind the tractor, being connected to the rear axle by two iron straps to saddles held by U-bolts. Thus the axle has no extra strain placed on it, and the tank can be easily removed when desired.

In cleaning the wider streets three or four motor sweepers are used. Two or three work the dirt from the center of the street toward the gutter and are followed by one working along the gutter and moving material out from the gutter. A pick-up sweeper follows, taking up the single windrow left by the sweepers ahead.



HOME-MADE MOTOR STREET-CLEANING EQUIPMENT

Top left.—Old horse-drawn flusher equipped with Fordson in operation. Top right.—Near view of motor flusher. Bottom left.—Close-up of Fordson sweeper. Bottom right.—Group of sweepers ready for action

Street Flushing

The old horse-drawn flushers with motor-driven pumps have been rigged with a Fordson hitch developed by the city and with a control operated from the driver's seat on the flusher. These outfits cause a smile when first seen, as they give the impression of a young colt pulling an elephant. The speed of the outfits and their faculty of turning very short corners

makes them particularly efficient. In operation the flusher is run up one side of the street, throwing a stream of water from one flusher nozzle across the street, a distance of about 30 feet. This wetting-down process is continued for one or two blocks. Then the flusher returns down the other side, repeating the wetting, and then again covers the street by going up the center and operating both nozzles. This flushes the streets very clean, leaving most of the material in the gutter. The flusher is followed by two men with hand brooms, one in each gutter. The piles are picked up promptly by men following with Fordson-hauled dump-trucks. This prevents scattering of the piles of traffic.

Formerly, three horse-drawn flushers covered 120 blocks in 8 hours, or about 40 blocks each. Equipped with Fordsons, these same flushers are cleaning 180 to 190 blocks in 8 hours. Three flushers costing $17.50 each to operate per shift are equal to four horse-drawn flushers costing $20 each per day. The use of the tractor units thus saves $27.50 a day. On the night shift formerly eight horse-drawn flushers were used, while now five Fordson flushers are doing the same amount of work. This leaves three flushers in reserve for emergency service.

Alley Cleaning

Most of the alleys of Denver are concrete-paved, with a small mileage of cobbles. The paving is dished just enough to drain down the center of the alley and away from buildings. The system of cleaning is to first have a dump-truck go through the alley and pick up all piles of leaves or rubbish put there by individual householders. The dump-truck is followed by two men who brush the dirt and rubbish remaining away from each wall into the path of the pick-up sweeper. The pick-up sweeper is home-made, using a bass broom to snap the material brushed up from the street into pans beneath the body. The pans are dumped at each alley mouth or more frequently when the pans are filled quickly with leaves. The pick-up sweeper runs up one side of the alley and back the other. It is followed by a dump-truck to take away the piles left by the sweeper. The truck has an average haul of about 3 miles to the dump.

This equipment when horse-drawn could clean about 60 blocks in 8 hours, while now it is cleaning over 100 blocks in the same time.

All brooms, both steel and bass, for the street sweepers and pick-up sweepers, respectively, as well as the hand gutter brooms, are made at the city shops.

Charles D. Vail is Manager of Improvements and Parks, F. J. Altvater, Highway Commissioner, and G. S. Duffield, Superintendent of the Street Cleaning Department.

Traffic Problems Stimulate City Planning

IN a rapidly growing number of cities and villages, where city planning has not heretofore appealed greatly to the conservative and "hard-headed" majority, acute problems of traffic relief and highway safety are forcing a new point of view. Aroused by costly congestion in the streets or by an intolerable increase in traffic accidents and deaths, official and unofficial groups are struggling to find the way out. The sequence of events, especially in the smaller cities and larger villages, is likely to be like this:

The chief executive of the municipality, with some inkling of the complexity of the problem, summons a group of public-spirited citizens and asks them to serve as the Mayor's Committee on Traffic Relief. When the members begin to analyze the task assigned to them, they discover that they must give thought both to (1) traffic regulation and to (2) traffic facilitation. They then discover that both of these main subdivisions of the problem must be further subdivided for adequate consideration. Traffic regulation is found to be partly a matter of control through (1-a) traffic ordinances and rules and (1-b) mechanical devices and traffic officers; and (1-c) a matter of the education of automobile drivers and pedestrians as to proper use of the streets. Facilitation of traffic also divides itself into subdivisions—(2-a) making the best use of existing highways, and (2-b) providing increased space for growing traffic needs.

When this stage of the discussion has been reached, if there is some one in the group who has given an occasional thought to city planning, he will point out the fact that the proper development of a highway and transportation system is the most fundamental basis of a city plan. If the municipality already has a City Planning Commission, which perhaps has been slumbering more or less on its job, he will urge that the new Committee on Traffic Relief, instead of duplicating the work of the City Planning Commission, should appoint a subcommittee to confer with the latter in behalf of more effective consideration of problems of traffic relief. On the other hand, if no official city planning body already exists in the municipality, it will be recognized that a unique opportunity is now afforded to create public opinion for the appointment of such a commission.

The Traffic Committee, official or unofficial, which attempts to cover all five of the phases of the problem just analyzed, will be assuming too great a task; but in many of the smaller municipalities it would be possible for such a committee to render exceedingly valuable service under the first four headings, and to become a stimulating force for adequate consideration of subdivision (2-b) by a city planning commission which shall employ expert advice for study and action in behalf of a comprehensive city plan.

—From *City Planning* for October, 1925.

The Terminable Permit for Public Utilities

A Discussion from the Corporation and Public Points of View

By Delos F. Wilcox

THE indeterminate franchise, or the terminable permit as it is sometimes called, is an instrumentality the usefulness of which depends upon how it is devised and how it is related to local conditions. It may be described as a working program for private ownership and operation of public utilities. Under municipal ownership and operation, broadly speaking, franchises and permits are not required. In the nature of things, therefore, the discussion of a franchise or permit policy assumes private ownership and operation, and its importance is limited in the main to those utilities which are privately owned and operated. Whether or not the terminable permit from the public point of view is good depends upon two things: First, the effectiveness of the control which it provides over public utilities under private ownership and operation; second, the facilities which it provides for a change from private to public ownership and operation.

A certain clash of interests between the private corporations owning and operating public utilities and the people whom they serve is a generally recognized fact. The private companies, in the very nature of the case, are and must be primarily interested in the profits of their enterprises; while the general public as consumers are primarily interested in getting the best practicable service at the lowest possible cost. The issue between these two conflicting interests is profits vs. service. I do not mean that the interests of the companies and of the public are antagonistic or even divergent in all particulars, but merely that there is this fundamental and inherent conflict between them under the régime of private ownership and operation. Perhaps it is nothing more than the inevitable conflict of interest between the seller and the buyer, but, at any rate, in public utilities, where monopoly is the rule, this conflict of interests is of immense and continuing practical importance. Any discussion of franchise policy will be blind and meaningless except as it is related to this conflict of interests.

A Municipal Problem of Nation-wide Importance

At the Illinois Public Power Conference, held in Springfield December 3, 1925, an address by Dr. Wilcox, from which the accompanying article has been prepared, was followed by the adoption of a resolution stating "that any law establishing the terminable permit as the franchise policy of the state will be inimical to the public interest unless it contains effective provisions for:

a. Continuity of public utility service and adequate expansion of public utility facilities to meet the public needs;

b. Unified operation of privately owned utilities rendering the same kind of service within a given municipality, subject to potential competition by municipal plants as now authorized by law;

c. In the absence of municipal competition in the sale of services to private consumers, local regulation of service and rates, by contract or otherwise, in cooperation with the state utilities commission and subject to its approval in matters of more than local interest;

d. Rates based upon the cost of service required, including a fair return upon the unamortized capital prudently invested in facilities for rendering the service, depreciation, and, to the extent required by the municipality, amortization of the capital account out of revenues;

e. Facilitation of the transfer of utility properties to public ownership and operation when required by the city, under a financial arrangement that makes such transfer practicable."

While the occasion for the Springfield meeting was the discussion of state legislation proposed for Illinois, the importance of the problem is nation-wide. In sending the manuscript of his paper to The American City, Dr. Wilcox writes:

"A campaign is shaping itself throughout the country for the adoption of the terminable permit in a form that will do away with what is left of municipal control over utilities and establish, as a uniform policy of government, protected monopoly in utility service under private ownership, subject to exclusive state regulation. This program is of such vast importance in its immediate and remote implications that I am sure it is a matter in which the readers of The American City will be keenly interested."

Results Desired by the Public Utility Corporations

From the point of view of the public service corporations, the indeterminate permit is a good policy to the extent that it assures or facilitates the following results:

1. *Continuity in*

operation and in the development of earning power, free from the periodical bickerings and uncertainties which go with the fixed term franchise.

2. *Monopoly in ownership and operation.*—At the minimum this means monopoly within a given urban area of a particular kind of utility. At the maximum it means a monopoly including an indefinite number of local areas, possibly reaching out to become statewide or even nation-wide, and also a combination of different kinds of utilities under one management or at least under one financial control. It is impossible to define exactly the limits of the monopoly for which the companies strive, but in any event it includes freedom from competition in utility service by public agencies or by other private concerns acting under public authorization.

3. *Regulation of public utilities by state commissions and by the Federal courts as distinguished from regulation by franchise contract or by municipal ordinance.*—Here again it is impossible to delimit exactly the program of the companies. Inherently they are opposed to public regulation except to the extent that public regulation may in itself be helpful to them; but as between local regulation and state regulation, they are strongly in favor of the latter. They do not wish to come to terms with their own consumers in the matter of rates to be charged for the service they render. But the companies are not willing to accept regulation by state commissions except as they are able to hold the commissions in check by invoking the aid of the Federal courts to prevent what they consider to be the invasion of their property rights.

4. *Utility rates based upon the "present value" of the companies' property and upon a rate of return sufficient to attract new capital into the enterprise as needed.*—The point here is that the companies are unwilling to have their profits limited to a fixed return upon the amount of the capital which they have actually invested in the enterprise. On the other hand, they demand the recognition of "value" regardless of cost. They are willing to accept a guarantee against capital loss, but they resist the elimination of the chance for capital profits.

5. *The continuation of the policy of private ownership and operation unless the municipality in any given case is willing and prepared to buy the existing utility plant and property as a going concern at a price to be fixed by judicial process and to pay cash therefor.*

A terminable permit law that will guarantee or at least promote the things which I have described seems good to the companies—they like it.

From the Public Point of View

On the other hand, from the public point of view, a terminable permit policy will be good in proportion as it secures the following public advantages:

1. *Continuity of service and continuous expansion of public utility facilities to meet public needs.*—Thus far, the interests of the private companies run along very closely with the interests of the public. Continuity of earnings, desired by the companies, is dependent upon continuity of service desired by the public. Expansion of earnings, desired by the companies, is dependent in the main upon expansion of service as required by the public; although in this matter a temporary conflict of interests may arise where the public requires a more rapid expansion of service than the assured or potential earnings of the enterprise will warrant. But in any case continuity and expansion, from the public point of view, as well as from the companies' point of view, should be greatly facilitated by the terminable permit as contrasted with the fixed term franchise.

2. *Unified operation subject to potential competition by the municipality if deemed necessary.*—Here again, the private interest and the public interest run along together to a certain point. The companies favor monopoly of a given type of utility service within a given area. The public interest also demands such monopoly, but only upon condition that public control can be made effective. Otherwise, a private monopoly becomes intolerable and from the public point of view, under our extremely complex governmental system, the danger that a guaranteed private monopoly, dealing in an essential public service, cannot be effectively and promptly controlled in the public interest is so great as to make it prudent and necessary from the public point of view that the door should be kept open to municipal competition in case the community deems it necessary to resort to it. After all, public utility companies exist for the people who need the service; the people and their needs do not exist for exploitation by the companies. If a public utility company in the possession of a franchise to serve a given community is unable or unwilling to render adequate service at satisfactory rates, the community must retain the right to serve

itself. The only restriction upon municipal competition consistent with good public policy is that the municipality, if it enters the field of public utility service in competition with a company enjoying a franchise to render the same kind of service, must not engage in unfair competition by reducing its rates below the cost of the service.

3. *Regulation of utility rates and service by the local authorities in cooperation with the state authorities subject to the terms and conditions of valid franchise contracts.*—Here the desires, if not the interests, of the private companies diverge sharply from the desires and interests of the public. The companies want to get away absolutely from local regulation; they do not want the consumers to have anything to say about the rates which they have to pay for utility service. In general, the companies favor exclusive regulation by a state commission, except that they prefer Federal regulation or no regulation at all for those activities which cross state boundaries. However, the companies are often willing to forego state regulation if they can have their utilities put under a so-called service-at-cost contract by which the rates will be automatically adjusted to the cost of service without the intervention of negotiation or a rate-making authority. Such an arrangement is welcome, particularly in the electric railway business, which for some years has been in a parlous state financially. In this utility at the present time the companies feel that they are lucky if they can be guaranteed the full cost of service, including a liberal rate of return upon the value of their property, and hence they are willing to accept a limited return if that return can be guaranteed through the automatic operation of a service-at-cost franchise. From the public point of view, exclusive state regulation, as generally advocated by the companies, is theoretically unsound and practically futile for several reasons:

OBJECTIONS TO EXCLUSIVE STATE REGULATION

a. Exclusive state regulation denies the right of municipal home rule in local affairs and denies to those most interested in utility service, those for whom the service is rendered, the right to control the character of the service or the compensation that shall be paid for it. In the very nature of the case exclusive state regulation tends to the destruction of local responsibility, to paralysis of municipal government, and to the strengthening and perpetuation of private policies as distinguished from public policies in public affairs.

b. Exclusive state regulation eliminates the right of the municipalities to negotiate enforceable contracts with the public utilities which occupy the streets and render public service. Franchise contracts, no matter how elaborate and no matter how solemnly they may have been assented to by the utilities themselves, are hardly worth the paper they are written on under a régime of exclusive state regulation.

c. Exclusive state regulation tends to perpetuate the policy of private ownership and operation by making it difficult for the cities to prepare for successful public ownership and operation through the exercise of intimate control over the utilities while they continue to be operated under franchise grants; also by the assumption that the investment in a utility is a perpetual one, not to be retired or diminished to any extent by amortization out of earnings.

d. Exclusive state regulation cannot be successful in the long run under our constitutional system, for the reason that the companies are able to hold litigation in the Federal courts as a club over the commission's head to prevent a fair and just consideration of the issues before it. The commission knows that a company affected by its order may at will enter the Federal courts claiming that the order is confiscatory, and thereby secure the suspension of the commission's jurisdiction until the matter has been threshed out through the Federal courts up to a decision by the United States Supreme Court, which, in the ordinary case, would involve a delay of from a year and a half to three years. Moreover, the commission knows that under its mandate it is bound to deal justly and reasonably with the company, as well as with the public, but that in the Federal court the only question that can arise is the protection of the companies. The question of confiscation being the sole issue, the Federal court cannot give relief to the public if the commission's order is unduly burdensome to the public. All the Federal court can do is either to let the commission's order stand or to require a revision of the rates upward. This sort of regulation is jughandled. Under these conditions regulation is suspended during the period of litigation in the Federal courts, and by the time a decision has been rendered by the United States Supreme Court the conditions are no longer the same as they were when the original order was made. The result of this system is that the commissions are forced to lean over backward in the protection of the companies in an effort to keep them out of the Federal courts, and the only way to accomplish that is to give them what they claim. This statement of fact is not an attack upon the integrity of the Federal judges. It is merely an attack upon the system which makes the Federal courts the companies' tribunals and limits their jurisdiction to the protection of the companies' property rights. This is the great outstanding fact that renders state regulation hopeless. Unless the municipality is in a position to enter into valid and binding contracts governing its relations with the public utilities which occupy its streets, it cannot secure the protection of the Federal courts.

4. *Rates based upon prudent investment and the cost of required service with depreciation and amortization included.*—Here also the interest of the companies and that of the public are for the time being at least divergent. In this period of high prices the companies stoutly reject the prudent investment theory

as the basis of valuation for rate or purchase purposes; while the public strongly opposes the rule that theoretical reproduction cost at current prices is a true measure of either investment or value as a basis for the adjustment of the financial relations between the company and the public. Under other conditions, with prices relatively low or sharply decreasing, the positions of the two parties might easily be reversed. That the rates must cover the necessary operating cost of the services which the companies are required to render is not a matter of dispute.

Under public ownership and operation it is unheard of that the basis of the investment in a public utility should be changed from time to time according to fluctuations in price levels. The city invests a certain amount of money in a utility plant, deriving it either from the sale of bonds or from taxes or from the earnings of the plant itself. The amount of the investment is fixed by the amount of money actually put into the property at the time when the plant is constructed or the extensions and additions made. If prices fall that does not relieve the municipality from the necessity of paying interest upon the full amount of bonds issued for utility purposes and of paying the bonds in full as they fall due. On the other hand, if prices rise, the municipality does not have to increase the rate of interest agreed upon or pay the bondholders more than the par value of their securities. In other words, under public ownership and operation the cost of capital entering into the rates does not fluctuate except with actual changes in the rate of interest paid or the amount of capital invested in the property.

From the public point of view, it is intolerable that a different rule should prevail in the case of privately owned utilities rendering public service. Except upon the basis of the prudent investment in property devoted to public use, there can be no stability in the relations between the companies and the public, and without stability public regulation is futile and the orderly development of the utility as a public servant impossible. The adoption of a fluctuating basis of valuation introduces the element of risk and speculation and destroys the security of the companies on the one side and the protection of the public on the other. Hence, it is clear that the divergence of interest between the companies and the public with respect to the basis of valuation is itself a temporary and fluctuating divergence. Justice and equity to both parties in the long run will be served by the recognition of the prudent investment as the basis for rates.

Another point of great importance is the recognition of the fact that depreciation in the utility property engaged in public service is an operating expense which must be covered by the rates. This does not mean that an allowance for accruing depreciation shall be made in such form as to be in effect an additional return upon capital. To the extent that permanent depreciation in a utility property has accrued and been paid back to the investors out of earnings, the capital value upon which rates are based should be reduced.

Another point of great importance from the public point of view is the amortization of the capital value out of earnings. The companies do not want the capital value of their properties reduced. So long as the earning power of the utility can sustain it, the companies inevitably favor an increasing capital value. Operating under monopoly conditions with flexible rates, the only limit to the increase in capital favored by the companies is the maximum amount which the enterprise will carry. An increasing capital value means an increase in the power and importance of the owners and operators of the utility; and beyond that it means a bulwark constantly being built up against the possibility of a change from private to public ownership. It is only when a utility gets into an inherently shaky financial condition where the capital value as measured by the securities outstanding can with difficulty be sustained that a private company may become converted to the theory of amortization; and then from its point of view amortization should be used only for the purpose of taking from the consumers and paying to the company an amount of cash sufficient to make good the shaky intangible assets.

From the public point of view, however, under the difficult political and financial conditions which restrict the practical development of the policy of public ownership, it is of greatest importance that the franchise policy authorized by the state should make it possible for the municipality through contract to provide for the gradual amortization of the capital value of the utility under private ownership as a means of reducing the purchase price and facilitating the ultimate acquisition of title to the property. Sometimes objection is made to the suggestion that the rates to consumers should be made high enough to pay the capital cost of a utility plant; but it is a matter of established public policy under pub-

lic ownership that bonds issued for utility purposes should be paid off out of the earnings of the utility and that additions and extensions so far as possible should be constructed out of surplus earnings. That under public ownership capital can be provided or capital obligations paid off out of earnings without excessive rates is due largely to the fact that a low rate of interest is sufficient to reward capital where it has security. Under present conditions, private companies are claiming and are being allowed by commissions and courts from 7 to 8 per cent as a fair and reasonable return upon the value of their property, which in most cases, as fixed by the rate-making authorities, is largely in excess of the actual cost or prudent investment. Obviously, the reduction of the capital value through the process of amortization from earnings tends strongly to stability and security of the investment, and it will be found that the difference between the current rate of return allowed upon present-day valuations and a sufficient rate of return upon a secured investment, if devoted to amortization purposes, would in most cases be sufficient to wipe out the capital value within a comparatively short period of years. It is infinitely important from the public point of view that this process should be facilitated under the franchise policy of the state.

5. *Change to public ownership made easy by amortization out of earnings, partial payments with bonds and conservative purchase price and no requirement for taking over an obsolete plant.*—The great obstacle in the way of progress in this policy at the present time is the financial one. The investment in the utilities necessarily is growing by leaps and bounds because of the rapid expansion in public needs and in the means of satisfying them. The narrow limits of municipal indebtedness imposed by constitutional and statutory restrictions on many cities make it impracticable for them to borrow enough money to pay for any one of the standard utilities operating in their midst. A terminable permit which gives a privately owned utility a perpetual franchise subject only to termination by purchase when the municipality is in a position to pay in a lump sum the full value of all the property of the utility as fixed by judicial process, is on its face a mockery. It keeps the word of promise to the ear and breaks it to the hope. It is imperative from the public point of view that the terminable permit, if adopted, should be adopted in such form as to make it practicable for the municipalities to arrange easy terms upon which to pay for the utilities they purchase and in any event to relieve them of the necessity of buying intangibles, making up alleged past losses and taking over obsolete property. If the city is to be as hard-headed as the critics of municipal government seem to demand, it certainly must be left in a position where it is not compelled to pay two or three prices for utility property in order to junk it and prepare for effective public service.

In conclusion, I will say that the fundamental danger in the type of terminable permit which the public utility companies favor is that it establishes an impossible scheme of regulation while private ownership continues and at the same time makes difficult and well-nigh impossible the change from private ownership to public ownership. On the other hand, an indeterminate permit law properly devised could make regulation of private companies infinitely more effective than at present and also facilitate the achievement of the policy of public ownership and operation.

Oakland Votes $9,960,000 for Harbor Improvements

TO carry out a program of harbor improvements formulated by a board of experienced harbor engineers, the voters of Oakland authorized at a special election on November 10, 1925, a harbor bond issue of $9,960,000. In the issue of *Oakland Outlook* published a few days before the election, the Oakland Chamber of Commerce made a strong plea for public support of the proposal, and listed large expenditures for harbor improvements by other western cities;

"*San Francisco* has expended more than $50,000,000 on its harbor—a good investment.

"*Los Angeles,* during the past ten years, has invested more than $29,000,000 in harbor facilities. Los Angeles sees ahead.

"*In Portland,* since 1915, more than $22,000,000 has been expended in port facilities and channel improvements.

"*Seattle,* during the past ten years, has spent $6,000,000 for docks, slips, warehouses, sheds, and equipment exclusive of Government expenditures and dredging."

Results of Black Base Pavement Construction in Pittsburgh

By J. D. Strain

Superintendent, Asphalt Division, Bureau of Highways and Sewers, Pittsburgh, Pa.

WHAT is known as "black base" is a bituminous concrete. The mixture which we are using, and which my experience has taught me is the most satisfactory, consists of 69 per cent slag, 25 per cent sand, and 6 per cent asphaltic cement. These percentages may be varied and stone may be substituted for slag, although my experience with slag has been much more satisfactory. This must be homogeneously mixed, after which, when laid and set, it becomes as hard and solid as any foundation that I know of.

In the city of Pittsburgh, during the last few years, I have laid thousands of yards of this with great success. This has varied in depth from 2 to 12 inches, with a probable average of 6 inches. In front of the Pittsburgh and Lake Erie depot, one of the busiest spots in our city, and where traffic is the heaviest, we laid a foundation of 12 inches of black base, with a 1½-inch top. This was in 1921, four years ago, and we have never been called back to put a tool on it in that length of time. It is as perfect to-day as when it was laid.

Those who are familiar with Pittsburgh know that Diamond Street, between Smithfield and Market Streets, particularly since the widening, bears as much traffic as any thoroughfare in any large city. There we laid a foundation of 10 inches of black base and a top of 1½ inches. The result there has shown the same satisfaction.

Resurfacing Block Stone

In earlier days in every city a great deal of block stone pavement was laid. We had this condition in Pittsburgh. The years passed on, and while the street was still there it did not have the smooth, even wearing surface desired by the auto driver. The question was whether to tear up these entire streets and put down a modern pavement from the ground up, or to salvage, if possible, the investment already made, which in our case was very great. And so we began covering this block stone with from 3 to 4 inches of black base and then placing a 1½-inch top. This treatment has been given to mile after mile of our city streets, with the result that we have mile after mile of high-class driveways, meeting every modern demand, with a saving of more than one-half of the cost of new construction.

Use of Black Base in County Work

The county of Allegheny outside the municipal limits of the city of Pittsburgh is a rapidly developing metropolitan district, where the same high-class highways are demanded as in the city. Four years ago I was instrumental in helping to install asphalt plants in the suburban districts which are owned and operated by the county of Allegheny. By the use of this black base and asphaltic top their roads have been reconstructed, widened and re-topped, until to-day they have over 550 miles of driveways as perfect as any city street. Here, too, by the application of the black base millions of dollars have been salvaged.

Favorable Points

Perhaps the biggest factor in favor of black base is that there is not the same danger of disintegration as in portland cement concrete, as it is more flexible. The hydraulic concrete is more rigid and more likely to disintegrate once a wound is placed in it. Further proof of this statement is shown by the fact that some kind of asphaltum is always prescribed as a treatment for any sore in a concrete pavement.

There is one other compelling factor in its favor to my mind. Those of us who are in the public employ and have the right point of view, must never lose sight of the fact that one of our outstanding duties is service, and that we should work at all times to provide a maximum of convenience and accommodation for the great public—those who pay our salaries and all the bills.

The use of black base is a wonderful agent in this respect. The quickness with which it can be utilized is a public benefit. It can be laid to-day and the street opened to-morrow. With black base you complete a job as you go along and make it ready for use.

ACKNOWLEDGMENT.—From a paper read before the Fourth Asphalt Paving Conference.

City Plan Committee Aids Development of Memorial Park

By W. E. Stockwell
Engineer, City Plan Commission, El Paso, Texas

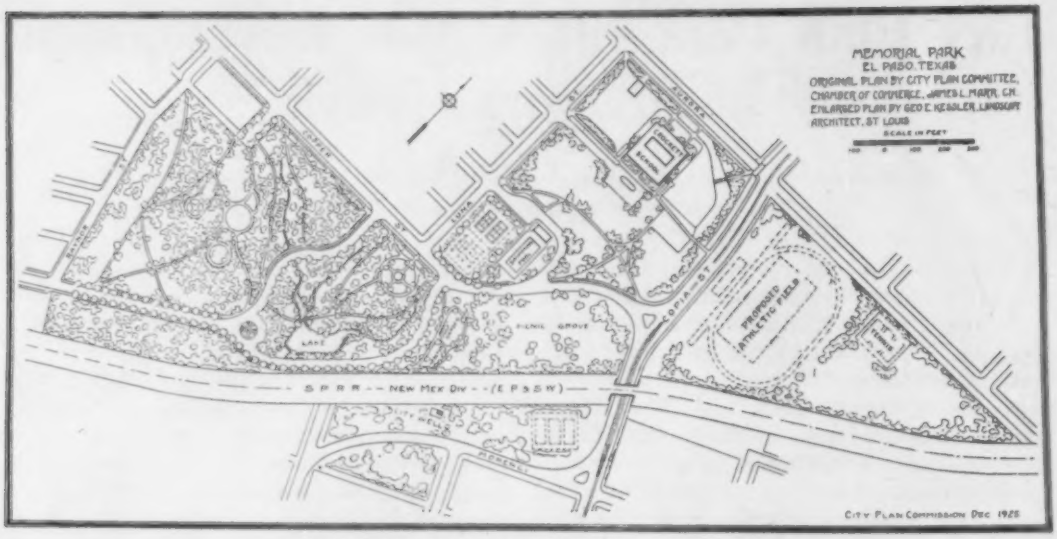
WHEN the City Plan Committee of the El Paso Chamber of Commerce was organized in 1920, its first activity was the development of the parks. The city had owned for several years a tract of about 25 acres of rough desert land, irregular in shape, along the tracks of the E. P. & S. W. Railroad and adjoining a good residential neighborhood. This was renamed Memorial Park, and a plan was prepared for the part which is now the west half, as shown by the accompanying plan.

As the work of grading and planting progressed under the direction of the Committee, interest in the project grew, and more land was gradually acquired, until the area of the park is now nearly twice that of the original tract, the final boundary on the north joining the property of the Crockett School and adding to its recreational facilities. The present park extends over one-half mile along the railroad and includes two fractional blocks south of the tracks, purchased to extend the benefits of the park to the residents of that section and to give better access to the Copia Street undercrossing by means of diagonal roads in the park.

This crossing under the tracks was shown on the original plan of the park and is distinctly a city planning achievement. The trolley tracks went under the railroad near this point on a private right of way, but the narrow passage on a curve and a steep grade was dangerous and the drainage was bad. It was proposed to open the street and carry the trolley over at grade, but this was prevented by the influence of the late George E. Kessler of St. Louis, who was then the planning consultant for the city. Copia Street is destined to become an important thoroughfare and is now being paved through the park.

Several thousand trees and shrubs were planted in the spring of 1921 and are now sufficiently grown to furnish some shade and to make the park attractive. A concrete swimming pool 50 x 120 feet was completed a year ago and has been very popular. City water is used, and is changed as often as necessary to keep the pool sanitary. The pool empties

TWO CHARMING VISTAS IN MEMORIAL PARK, EL PASO, TEXAS. THE LOWER PHOTOGRAPH SHOWS THE GROWTH OF TREES AND SHRUBBERY THREE YEARS AFTER PLANTING


MEMORIAL PARK
EL PASO, TEXAS
ORIGINAL PLAN BY CITY PLAN COMMITTEE, CHAMBER OF COMMERCE, JAMES L. MARR, CH.
ENLARGED PLAN BY GEO E. KESSLER, LANDSCAPE ARCHITECT, ST LOUIS
SCALE IN FEET
PICNIC GROVE
COPIA ST
PROPOSED ATHLETIC FIELD
TENNIS
S P R R — NEW MEX DIV — (E P S W)
CITY PLAN COMMISSION DEC 1925

PLAN FOR MEMORIAL PARK, EL PASO, TEXAS
The original plan was made by the City Plan Committee of the Chamber of Commerce; the enlarged plan by the late George E. Kessler, who was then the planning consultant for the city

THE BATHING POOL IN MEMORIAL PARK, EL PASO
This is one of the most popular of the city's recreation features

into an arroyo leading to a small lake in the park, and plans are being studied to use the water for irrigation so that none will be wasted. Two concrete tennis courts have been built and more are demanded to meet the growing interest in outdoor sports.

NEW YORK CITY'S BUDGET FOR 1926—$437,000,000

A supplement to *The City Record* for Nov. 10, 1925, gives, in 80 large pages, the details of the budget adopted by the Board of Estimate and Apportionment of the City of New York for the year 1926. The total is $437,000,000, equivalent to nearly $1,200,000 for each day in the year. Included in the budget are items aggregating $11,953,774 for county purposes and $17,564,808 for state tax, leaving a total of $407,481,418 for the city itself.

Child Hygiene for Local Health Departments

By Henry B. Costill, M. D.

Director of Health, Department of Health of the State of New Jersey

NUTRITION and environment during the period of rapid growth—infancy and early childhood—affect so vitally the health of school children and adults that child hygiene becomes the most important single activity in public health administration. That this importance is now appreciated, is indicated by the action of the Committee of Health Department Practice of the American Public Health Association, which has assigned, in its recently adopted rating schedule, a value of 350 points for child health work on a scale of 1,000 for all health department activities. As a contrast, it is interesting to note that sanitary inspection service is given the value of but 20 points in the same schedule. Although few local health boards have devoted to child hygiene the proportion of effort and funds which the Committee on Health Department Practice believes the work should receive, most of the active local health boards of New Jersey have undertaken some child hygiene activities. The variety of projects undertaken indicates the need for a sound definition of child hygiene and an outline of the facilities needed to accomplish the purposes of this most important health activity.

Child hygiene should be interpreted to include all those activities which tend to make child life more nearly perfect, growth more vigorous, and decay more remote. In essence, child health administration is teaching parents and attendants of children the principles of hygiene, nutrition, and sanitation, to the end that the child may be born without avoidable handicaps, properly cared for and nourished, and watched carefully for developmental defects which may be prevented, or corrected if they are unavoidable. The essential unit of any project for improving child health is the teacher of child hygiene, the nurse who visits parents in their homes.

Among the many and diverse activities included in child hygiene, special emphasis must be placed upon the supervision of expectant mothers, the extension of maternal nursing, the instruction of mothers in child nurture, the regular medical examination and supervision of the child from birth to adolescence, and the removal of social and sanitary conditions which interfere with the well-being of mothers and children and the integrity of the home.

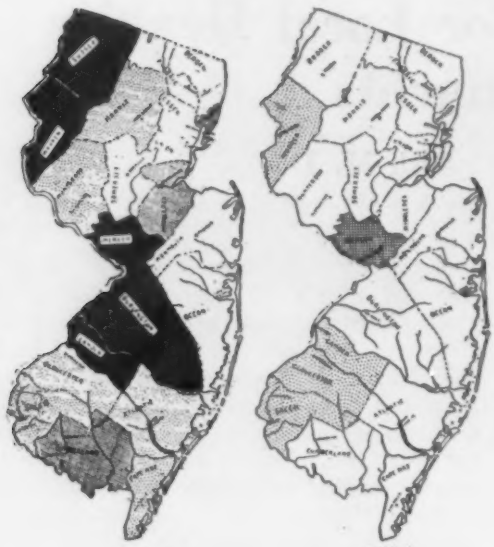
Better supervision of pregnant women is necessary not only to protect the mother from complications of pregnancy and childbirth, but to make possible a reduction of neo-natal deaths (of infants under one month of age). The urgency of this work is strikingly indicated by the high maternal death-rate throughout the country and by the fact that the rate in New Jersey has shown no decrease, as one might expect with the general reduction in death-rates. The United States has the highest maternal death-rate of the civilized countries, and the New Jersey rate, though less than that of the country, is unnecessarily and distressingly high. That this rate can be lowered is evidenced by the fact that the maternal mortality among mothers supervised by child hygiene nurses is approximately but half the rate for the entire state.

Improved prenatal service is dependant upon the existence of a prenatal clinic to which the child hygiene nurse can refer for periodic medical examinations those expectant mothers who cannot pay for prenatal examination by private practitioners. The clinic should be available principally for the examination of

A Constructive Program

As summarized by Dr. Julius Levy, Consultant of the Bureau of Child Hygiene of the New Jersey State Department of Health, the purposes of the child hygiene program are: to teach mothers to care for themselves, particularly during the prenatal period; and to teach them to care for their infants and children.

In the beginning of organized child hygiene work in New Jersey, the definite purpose was to prevent infant and maternal mortality. From this negative point of view the State Department of Health has moved to the more positive one of constructive health work.



PROGRESS IN REDUCING DEATH-RATES IN NEW JERSEY

Key: Black—county with more than 100 infant deaths per thousand live births; cross-hatch—from 90-99 infant deaths; dotted—from 80-89 infant deaths; white—less than 80 infant deaths per thousand live births

women expecting to be delivered by midwives. At the time of the examination the expectant mother is given hygienic advice by the practicing physician or clinician, and the nurse becomes responsible for seeing that the instructions are carried out by the mother.

Woman generally are yet so uninformed of the importance of frequent prenatal examinations and of the danger of neglect that it is difficult to find pregnant women early enough to make the examinations of value. In the communities carrying on the continuous child hygiene program, in which one nurse visits the homes of school children as well as those who are below school age, she has an opportunity of meeting pregnant women who are mothers of older children; but only through the general educational and publicity work of the nurse can expectant mothers during their first pregnancy be found and interested in prenatal examinations.

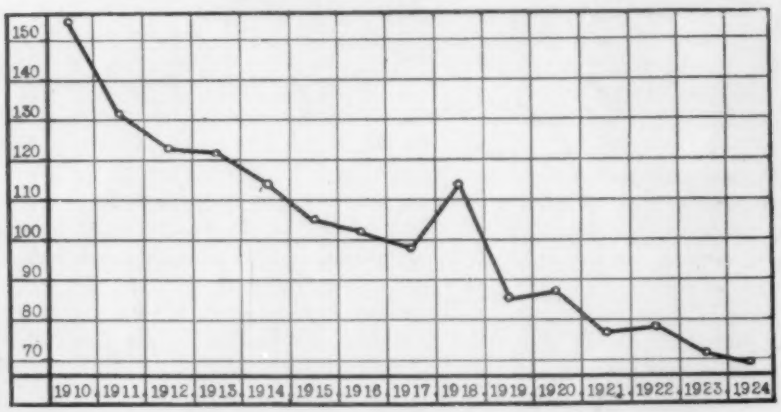
Infant Health Rates the Real Test of a Child Hygiene Program

The effect of child health conservation is measured most easily in the decline of infant and neo-natal death and morbidity rates, but the real effect of child hygiene is found in intangible, but none the less vital, infant health rates. The decline in infant mortality shown in the graph on the following page is gratifying, but there has been no corresponding decline in neo-natal deaths.

The saving of infant lives shown by the foregoing table and graph has been accomplished by placing under supervision as large a number as possible of new-born babies as soon after birth as they can be reached. If the supervision of the mother has not been begun before the birth of the child, the nurse makes the first visit after the report of the birth has been received by the registrar of vital statistics. The nurse takes to the mother the birth certificate issued by the board of health, and (with the consent of the attending physician) begins the instruction which is continued until the child leaves the public or

INFANT MORTALITY RATE IN NEW JERSEY FOR THE PERIOD 1910-1924

Number of Infant Deaths per Thousand Live Births



No single cause can be assigned to this marked decrease in infant deaths; however, child health work in New Jersey has played an important part in this reduction, as is indicated by the data at the right, which show the death-rate among infants supervised by child hygiene nurses to be about half the rate for the entire state

INFANT DEATH-RATES IN NEW JERSEY

1920-25 Averages

Number of infant deaths (over one week and under one year) per thousand live births:
(Average for five-year period)

For the entire state—53*

For infants supervised by nurses under the New Jersey continuous child hygiene program—28.7

*** Does not include infant deaths under one week, in order to make rates comparable, because nurses do not always begin supervision before the infant is one week old.**

parochial school. The instruction includes the principles of personal hygiene, infant care, and the value and technique of maternal nursing, imparted to the mother during home visits by the nurse and during the mother's visits to the Baby-Keep-Well Stations, where the physician in charge gives medical advice.

As its name implies, the Baby-Keep-Well Station is intended not for the examination and treatment of sick infants, but only for the examination of apparently well babies in order that they may be kept well and free from avoidable physical defects. It is the policy not only to refrain from treating children's ailments but to abstain as well from giving medical advice about diseased conditions: when an apparently well baby is found to have a diseased condition or physical defect, the mother is referred to her family physician for re-examination and treatment, or to a hospital dispensary, should she be without funds. The nurse follows-up the family to see that corrective treatment is administered, for the child hygiene program is remedial as well as preventive, even though the emphasis is placed upon the latter.

THESE HEALTHY, HAPPY, NORMAL TWINS ARE LIVING ADVERTISEMENTS OF THE CHILD HYGIENE PROGRAM

Supervision of the Pre-School Child

During the first six years of life the child should be under constant supervision, which means periodic medical examinations, during which advice is given to the mother by the physician, to be followed-up by the child hygiene nurse to see that hygienic suggestions are acted upon and that remedial defects are corrected as soon as possible after detection. But in the continuous child hygiene program, the pre-school age group (from two to six years) is not so important as the earlier period, for, if the mother has received prenatal care and has been instructed properly to care for and feed her child during his first two years, the pre-school age should be passed satisfactorily.

It is important, however, during this period to teach mothers the importance of nutrition and cleanliness, for it has been observed that a large number of school children have physical defects resulting from neglect of the rules of hygiene during the run-about period. For example, an English report shows that defects of vision commonly begin during the fourth year, due to imperfect nutrition and lack of cleanliness. Such defects can be avoided under the continuous child hygiene program, for the nurse, while visiting the home for the particular purpose of supervising the new-born baby or the expectant mother, can impress upon the mother the importance of careful and periodic physical examination of the pre-school child either by the family physician or at the Keep-Well Station.

The Hygiene of the School Child Should Be a Part of the Continuous Program

A large proportion of the defects especially emphasized in school work, such as carious teeth, malnutrition, defects of eyes and ears, have their beginning in the pre-school period and can be prevented by effective prenatal and infant hygiene; it is illogical, therefore, to begin child hygiene work with the school child. It is inefficient, as well, to separate the supervision of the school child and the infant, placing the former under the jurisdiction of the board of education when the preliminary work has been conducted as a health board activity. In effect, it means that two nurses

(if any follow-up is attempted to correct defects found in school children) must cover the same territory, making for duplication of effort in many cases and leaving unsupervised the children who do not come within the jurisdiction of the one or the other.

The health of the school child is as much a responsibility of the board of health as is that of the infant and the adult. The logical and legal method of conducting child health work is to so district each community that one nurse, responsible to both the board of health and the board of education, can carry out the supervision of all children. The nurse who assists the school medical inspector in the examination of school children goes to the homes to see that remediable defects are corrected and diseased conditions are treated; at the same visit she can supervise the expectant mother, and the infant and pre-school children may also receive the benefit of her help. This is the plan carried out successfully in many communities which have adopted the continuous child hygiene program.

THE BABY-KEEP-WELL STATION IS PRIMARILY AN EDUCATIONAL CENTER AT WHICH PHYSICIANS EXAMINE APPARENTLY WELL BABIES IN ORDER TO GIVE MOTHERS HYGIENIC ADVICE AND SUGGESTIONS ABOUT NUTRITION
Sick babies are not treated but are referred to family physicians

Important Accessory Functions in the Continuous Child Hygiene Program

Although the teaching of hygiene by nurses visiting in the home is the cornerstone of all child health work, there are certain accessory functions which cannot be neglected. In New Jersey, midwives deliver more than a quarter of all new-born children (formerly nearly half the children in some cities were delivered by midwives), but the importance of midwife supervision is to be estimated not only by the proportion of births attended, but by the midwife's influence upon the after care of the baby by mothers most in need of expert advice. Under the supervision of the State Department of Health, the number of midwives has been reduced by the elimination of those not suitably trained for the work or unqualified to obtain a license. Nurses engaged in the continuous child hygiene program have accompanied the midwives upon their professional duties, have instructed them in the methods of teaching hygiene to mothers, have advised them to send all women whom they expect to attend later to a prenatal clinic for a preliminary examination, and have ascertained that all pregnant women are referred to obstetricians when abnormalities have been encountered.

Midwives always will be sought by certain foreign groups; it is the logical plan to license and supervise them as is done in New Jersey, rather than to ignore them, as in certain other states in which few steps are taken to prevent illegal practices. Incidentally, it is worthy of note that the New Jersey maternal death-rate and still-birth rate is lower among the mothers and children delivered by midwives than for those delivered by physicians. Although social and racial influences undoubtedly have some relation to the difference in these rates, the results indicate that midwifery properly regulated and supervised can exist without detriment to the maternal mortality rates.

Infant Boarding Homes Are Kept Under Close Supervision

The notoriously high death-rate among children boarded in unsupervised boarding homes, particularly in so-called 'baby farms," led to the adoption by the State Department of Health of strict rules for the boarding of infants. Under these rules, and local ordinances including similar provisions, nurses employed in the continuous child hygiene program keep in close touch with all infant boarding homes, which are licensed to care for only a limited number of children. These periodic visits insure the children a sanitary environment, periodic medical examination, and proper hygiene.

In addition to the supervision of midwifery and infant boarding homes, the program includes the improvement of birth reporting, the prevention of blindness, the keeping together of unmarried mothers and their children, and mental hygiene for the so-called "problem child." The state program also includes educational work in continuation classes where employed girls are taught personal hygiene, child hygiene, and the nature and prevention of contagious diseases. Lectures on child hygiene are given, as a part of the course of the state normal schools, to all students in training for the teaching profession.

The State Department of Health offers to any community a free demonstration of the practical value of the continuous child hygiene program, provided the local boards of health and education agree to continue the plan in cooperation when they are convinced that the scheme is a success. Already 105 communities have been satisfied with the program and have assumed financial responsibility.

Why Spend on the Few the Money That Will Maintain the Health of the Many?

The child hygiene program as outlined and conducted in New Jersey may not appeal to some persons because it lacks the spectacular features which make for popular interest and enthusiasm. Nutrition classes for the relatively few undernourished children, sight-saving classes for the handful of children with grossly defective vision, cardiac and orthopedic classes so appeal to popular fancy that the prosaic but much more important preventive work of the child hygiene program too frequently is neglected. Official health agencies cannot permit themselves to spend for the treatment of a few the money that will maintain in health the many; to spend for the discovery of defects in school children the money that will prevent these defects from developing when applied to the instruction of the mother in child nurture and to the supervision of children of pre-school age; to spend in the treatment of marasmus, atrophy, and summer complaint the money that can prevent these conditions and make healthy, romping children if the money is spent in teaching and helping the mothers to nurse their babies. It is to be remembered that there is only a limited amount of money and energy available; shall a local health department spend it "to make a child life more nearly perfect and growth more vigorous," or merely "to make decay a little more remote"?

THE NURSE ASSISTS THE SCHOOL MEDICAL INSPECTORS IN MAKING PHYSICAL THAT THEY IN TURN MAY HELP THE MOTHERS
In addition, the nurses supervise the midwives and go with them on professional calls

Items from Here and There

Number of Days' Vacation Allowed to Members of Fire Departments

A PAMPHLET recently compiled by the Dauntless Club of the Buffalo Fire Department includes, among other interesting fire department statistics for cities of 50,000 population and over, information as to the number of days of vacation allowed to the firemen in each city. The total number of cities reporting on this subject was 137. It appears that a two-weeks' vacation is by far the most general custom, 102 of the departments reporting that they allow their men either 14 or 15 days' vacation each year. An analysis of the replies follows:

Number	giving	21	days'	vacation	1
"	"	20	"	"	3
"	"	18	"	"	1
"	"	16	"	"	4
"	"	15	"	"	45
"	"	14	"	"	57
"	"	13	"	"	1
"	"	12	"	"	1
"	"	10	"	"	12
"	"	9	"	"	1
"	"	8	"	"	1
"	"	7	"	"	5
"	"	0	"	"	5

The two-platoon system is in use in 128 of 139 cities reporting on that subject. Of 130 cities reporting as to allowances made for sickness, 100 allow full pay, 12 allow half pay, and 18 have no sickness allowance.

A Month's Work of a City Sealer

SOME idea of the size of the gasoline business in such a city as Dayton may be obtained from the fact that City Sealer Roy L. Taylor inspected 309 gas pumps in a recent month, as reported in the *Dayton Municipal Review*. Of that number eight were found to be inaccurate and were ordered repaired.

During the month the Sealer and his assistants visited 532 retail establishments and re-weighed 1,223 packages. Not a single one of them was found to be under weight. They also tested 701 scales, ordered repairs and adjustments to 31 of them, and confiscated 4 sets. Seven hundred and ninety-three poise weights tested were found to be correct, but of the 657 measures tested, 3 were found inaccurate.

Annual Cost of Traffic Delays in Toledo Estimated at $7,500,000

ACCORDING to an estimate prepared by C. Burton Nickels, President of the Toledo Automobile Club, as outlined in the *Toledo City Journal* for November 14, 1925, the yearly cost of traffic delays to the people of Toledo exceeds $7,500,000.

Mr. Nickels patterned his computation after a similar report prepared by the Cleveland Automobile Club. He estimated an average traffic delay of 15 minutes per day for each of the 300 working days in a year for every one of the 68,200 motor vehicles in Toledo and he reduces this to the monetary loss in time, wastage of gasoline, accidents, depreciation, etc.

The loss of time to the drivers of the 9,200 motor trucks operating on the streets by reason of this 15 minutes' delay is 50 cents a day per truck, or for all of them, $1,380,000 a year. This allows a $2 per hour value for the services of man and truck.

Each automobile wastes an average of ½-gallon daily by reason of traffic tie-ups when the engine is idling but consuming fuel. This loss would amount to $1,770,000 for the 59,000 passenger cars. If the time of the drivers is worth 40 cents per hour, the total yearly loss would amount to $2,665,000.

A loss of $1,705,000 is assigned to depreciation, accidents as a result of traffic delays, and miscellaneous factors. This averages $25 per year per car.

In addition to the foregoing items, which amount to $7,520,000 a year, there is an additional loss of $1,350,000 in the time of the 30,000 passengers, who also lost time by reason of these traffic delays.

"While this tabulation may appear a little far-fetched to some at first glance," says the *Toledo City Journal*, "yet closer scrutiny shows that even if the monetary loss were only one-half the above amount, the cost of the installation of traffic signals, separation of grades, creation of parking spaces, etc., which would remedy these conditions, would be largely offset by the saving in time and money to motor vehicle owners here."

Board of Health Not Required to Issue License for Public Eating-Place Where Sanitary Ordinances Had Not Been Complied With

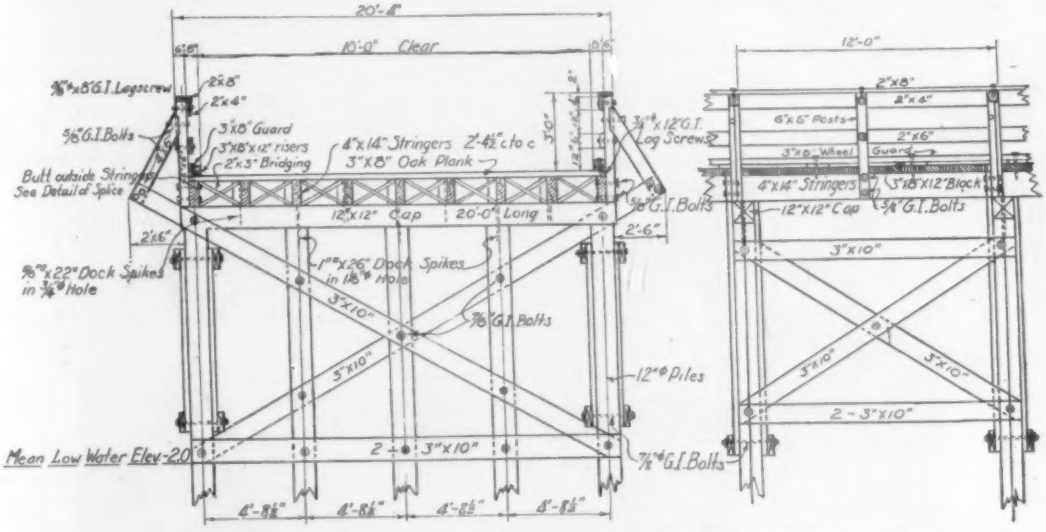
THE relator was refused a license by the defendant city board of health to conduct a public eating-place in a lunch-wagon on the ground that he had not obtained a permit from the city building department. In a mandamus proceeding against the board of health and its secretary to compel the issuance of a license, the agreed state of facts disclosed that the relator had failed to comply with the ordinance of the board of health regarding plumbing and drainage as well as with the provisions of the building code. The defendants claimed that the failure to comply with the sanitary ordinance justified the refusal of the license. The relator contended that the board of health, having placed its refusal of the license on a single ground, could not avail itself of the grounds set forth in the agreed state of facts, and also contended that he had complied with all the conditions of the sanitary code that were preliminary to the issuance of the license. Regarding the relator's first contention, the Supreme Court [of New Jersey] held that it was the status of the parties and their rights as they appeared in the pleadings that controlled, and that the board of health could avail itself of the grounds set forth in the agreed state of facts. As to the relator's second contention, the Court held that the board of health was not required to issue the license for the eating-place prior to the board's approval of the sanitary conditions under which the license should operate. (Cohen v. Thompson, Secretary of Board of Health, et al., 129 Atl. 700.)

—From *Public Health Reports* for October 16, 1925.

Creosoted Timber Bridge Connects Two New Jersey Counties

Unusual Design of Structure Built Across Mullica River

EARLY in October, 1924, the construction of a creosoted timber highway bridge across the Mullica River at Lower Bank, N. J., to connect Burlington County on the north with Atlantic County on the south, was begun. This bridge replaces a highway structure built of untreated cedar which had outlived its usefulness and was in extremely poor condition when dismantled. The new bridge is now complete, including the draw-span and the roadway surface, and was opened for traffic October 1, 1925.



DETAILS OF CONSTRUCTION OF HIGHWAY BRIDGE OVER THE MULLICA RIVER, NEW JERSEY
At left, typical section, showing construction details of creosoted timber. At right, elevation of structure, showing one panel

The new treated structure is 1,284 feet overall in length with a Strauss bascule draw-span allowing a clear passage of 30 feet. The north and south approaches are of bulkhead design and respectively 350 feet and 480 feet long, with culverts of 30 feet clear passage located 135 feet and 200 feet, respectively, from the bridge proper. The bulkhead is constructed of 25-foot to 35-foot creosoted piles spaced on 5-foot centers 20-foot anchor piles, 20-foot and 24-foot creosoted sheet piling, two rows of 6- x 8-inch waling and dirt fill with an 8-inch compacted gravel surface. The approaches are level except for a slight grade near the trestle construction. They have a clear roadway of 18 feet 8 inches. The north and south trestles are built with about a 2 per cent grade approaching the draw-span. There are 454 feet of trestle construction, including the 30-foot draw-span. This construction has a clear roadway of 18 feet. Five 40-foot piles centered at 4 feet, 8½ inches are used to each trestle bent. Sway braces 3 inches by 10 inches are extended to support the guard-rail braces. Bents are spaced on 12-foot centers, and caps are 12 inches by 12 inches by 20 feet. The stringers are 4 inches by 14 inches and are continuous over two panel lengths; nine rows of stringers are used, 2 feet, 4½ inches center to center with the outside stringers butt-jointed and those on the inside lap-jointed. Pieces 2 inches by 3 inches in size are used as bridgings for stringers midway between bents and over each bent. The flooring is 3 x 8-inch oak plank. The bridge was designed to sustain two trucks weighing 20 tons each and traveling abreast.

Ten ice fenders protect the structure, six to the north of the draw-span, and four to the south. Six 35-foot piles are used in each fender.

The construction of the Mullica River bridge required 26,000 linear feet of piling treated with 12 pounds of creosote per cubic

VIEW OF CREOSOTED TIMBER BRIDGE OVER MULLICA RIVER AT LOWER BANK, N. J.

foot with a specified penetration of at least 2 inches, and 246,431 board feet of short-leaf pine timber impregnated with 16 pounds of creosote per cubic foot. All piles, except those for the piers supporting the bascule span, and all timber, except the guard-rail and floor plank, are of pressure-treated material. A thorough brush coat of creosote was given the pile heads at cut-off and all other surfaces cut on the job after treatment and all bolt holes were filled with creosote.

The Mullica River bridge was built by the Hill Construction Company, Mt. Holly, N. J., under the joint supervision of H. B. Smith, County Engineer of Burlington, and A. H. Nelson, County Engineer of Atlantic County. We are indebted to F. L. Branin, Assistant County Engineer of Burlington County, for the information furnished in this article, and to M. F. Baldwin, Editor, *Wood Preserving News*, Chicago, for the three illustrations used.

BULKHEAD CONSTRUCTION OF APPROACHES SHOWN IN FOREGROUND, AND BRIDGE PROPER WITH ICE FENDERS IN BACKGROUND

League of California Municipalities Opposes Liquor at Conventions

OPPOSITION to the use of liquor or of questionable methods of entertainment by exhibitors at future conventions of the League of California Municipalities was voiced in no uncertain terms at the recent annual meeting of that organization in Long Beach. The resolution states that the League meets for the betterment of public affairs and to build up a greater respect for municipal government, and that exhibit space will hereafter be refused to any exhibitor using methods of entertainment that cannot be followed publicly and openly.

The Effect of the Period of Storage on Micro-Organisms in Reservoirs

By Robert Spurr Weston
Weston & Sampson, Consulting Engineers, Boston, Mass.

THE period of storage in a reservoir is sometimes expressed as "days of storage" and sometimes as "the storage ratio." The latter is the storage capacity of the reservoir divided by the mean annual run-off. Thus, a reservoir which stores the mean annual run-off, stores the water 365 days or has a storage ratio of 1.00. Again, a reservoir having a storage ratio of 0.33 stores the mean annual run-off for four months. Because there is no such thing as the orderly displacement of stored water by entering water, because wind and temperature produce mixing currents, and because the run-off itself varies with the season and the year, these figures represent average conditions only, but nevertheless they are of great utility for the study and planning of reservoirs for water-supply.

Index of Frequency

The relation between the normal period of storage and the frequency of occurrence of organisms did not escape the attention of the classical writer in this field, the late George Chandler Whipple. He compares the period of storage in days with what he terms the "Index of Frequency," as follows:

"It was assumed that when the organisms were less than 500 per c.c. they would cause no trouble; between 500 and 1,000 per c.c., little trouble; between 1,000 and 2,000, noticeable trouble; between 2,000 and 3,000, decided trouble; and that above 3,000 the trouble would be serious. From the analyses, the per cents of the time when the organisms were present within these limits were ascertained. These were then weighted as follows and added together: for numbers between 500 and 1,000, one-half the per cent; for numbers between 1,000 and 2,000, the per cent as computed; for numbers between 2,000 and 3,000, twice the per cent, and for numbers above 3,000, three times the per cent. The above was based on organisms of all kinds, disregarding genera.

"An index of 50 would mean that the growth of organisms was noticeable half the time, or that if they were present for less than half the time, they were more troublesome during the time they were present.

"The maximum figure for the index of frequency possible by this method of computation would be 300, but it is rare indeed that any natural water gives an index of more than 100, and in the best stored waters the index is generally less than 10. The minimum, of course, is 0."

A Valuable Study for Reservoir Design

This short paper, presented before the New England Water Works Association, reports observations of the relation between the period of storage of water in a reservoir and the average number of micro-organisms growing therein. The preparation shows a keen appreciation of the value of statistical analysis in the study of sanitary work. The results of this particular study should be shown in more careful design of impounding reservoirs than in the past, to reduce the later difficulties frequently experienced with growths of micro-organisms.

This Index of Frequency refers to organisms which cause trouble, and not to all organisms. The following figures given by Mr. Whipple for forty-seven lakes which he studied show the relation between this index and the normal period of storage:

TABLE I
RELATION TO PERIOD OF STORAGE

Storage Ratio	Period Days	Number of Lakes Index 0–25	Index 25–50	Index 50–100
0— .13	0— 50	1	1	1
.14— .27	50—100	2	1	1
.28— .54	100—200	7	2	3
.55—1.36	200—500	8	4	7
1.37 and over	500 and over	2	5	2
Total		20	13	14

These figures do not lead to very definite conclusions. They show that three-quarters of the lakes which have a low Index of Frequency store water from 100 to 500 days. On the other hand, ten of fourten reservoirs which store water for the same period have a high Index of Frequency, that is, from 50 to 100.

New Jersey Studies

In connection with the studies made for the North Jersey District Water Commission, it was of interest to compare the relation between the storage ratio in several lakes and reservoirs in the highlands of New Jersey and the average number of microscopic organisms, not the Index of Frequency, found therein. The following table shows these relations:

TABLE II

SHOWING RELATION BETWEEN STORAGE RATIO AND MICRO-ORGANISMS OF VARIOUS RESERVOIRS IN THE WANAQUE AND PEQUANNOCK DRAINAGE AREA, RESPECTIVELY

Body of Water	Drainage Area Square Miles	Capacity M. G.	Yearly Inflow M. G.	Storage Ratio	Micro-Organisms Standard Units per C. C.
Sterling Lake	5.1	3,586	2,360	1.52	93
Greenwood Lake	27.1	14,079	11,354	1.24	188
Canistear Reservoir	5.6	2,407	2,625	0.92	366
Clinton Reservoir	10.5	3,518	4,935	0.71	558
Pequannock, total	63.7	11,808	29,890	0.39	518
Oak Ridge Reservoir	27.3	3,982	12,800	0.31	569
Echo Lake	4.6	613	3,982	0.28	579
Forge Pond	14.7	7.5	7,090	0.11	652

Comparing similar data relating to the Croton system of reservoirs for the year 1907 (from Whipple), we get the results given in the following table:

TABLE III

Lake or Reservoir	Storage Ratio	Microscopic Organisms per C. C. Year	Summer Months
Lake Gilead	1.60	56	94
Lake Mahopac	1.53	447	227
West Branch Res.	1.47	1,084	1,010
Muscoot Reservoir	1.26	1,069	1,239
Titious Reservoir	0.86	1,798	1,271
Lake Gleneida	0.67	219	348
Kirk Lake	0.54	1,230	1,132
Middle Branch Res.	0.53	1,732	2,048
Boyd's Corner Res.	0.35	284	444
Sodom Reservoir	0.18	807	799

While all of these reservoirs are not independent and in some cases they are fed from other reservoirs rather than from streams, and while the numbers of organisms in the smallest two reservoirs are comparatively small, the data show that the apparent effect of storage is to reduce microscopic growths.

If we compare the reservoirs which store for more than one, one, and less than one seasonal overturn, we get the following interesting tabulation:

TABLE IV

Period of Storage	Average Storage Ratio	Average Micro-Organisms per C. C. Year	Summer Mos.
More than one overturn	1.46	539	642
One overturn	0.72	1,008	810
Less than one overturn	0.53	1,013	1,106

From Table IV, the advantage of long storage may be readily deduced by careful inspection.

Considering now the independent reservoirs of the Massachusetts Metropolitan System, we may compare the weekly or bi-weekly observations for the years 1912 to 1916 with the interesting results given in the following table:

TABLE V

MASSACHUSETTS METROPOLITAN SYSTEM

Reservoir	Storage Ratio	Micro-Organisms Standard Units per C. C. Surface	Bottom
Wachusett	1.46	645	371
Whitehall	.79	349	...
Hopkington	.75	354	...
Ashland	.48	456	...
Cochituate	.32	3,258	4,909

Apparently the Wachusett reservoir is somewhat out of line with the general rule. This discrepancy is explained easily by its comparatively recent construction, relative to the time the data were secured. It is also a fact that some purified sewage reaches Lake Cochituate.

In General

It seems quite generally true that in the uplands of the northeastern United States the reservoirs suffer from growths of microscopic organisms in inverse ratio to their storage facilities.

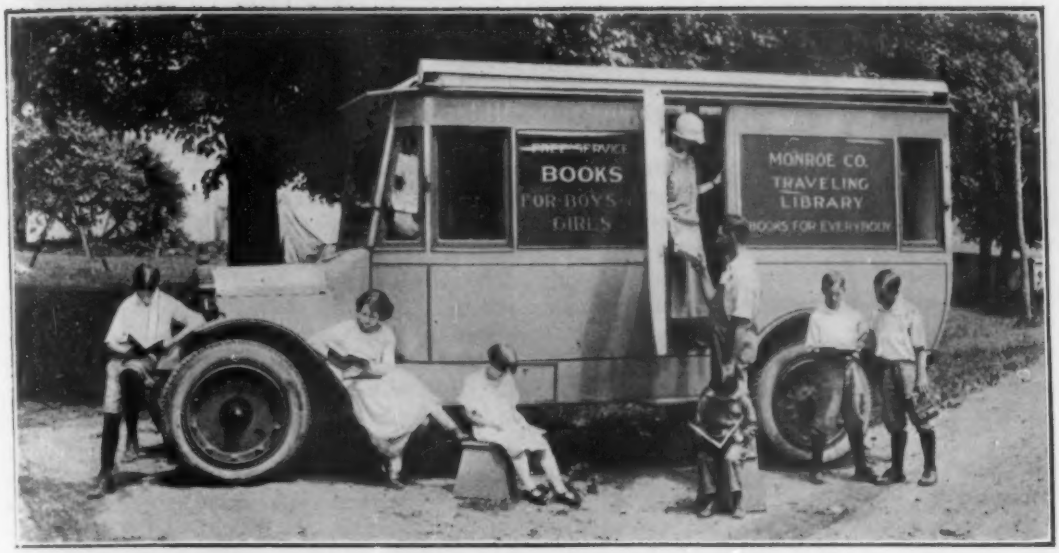
The reservoirs which suffer most are those whose storage ratios are below 0.70, especially those which are below 0.40. Those reservoirs are most free from growth which store waters for a period that includes both spring and fall overturns of the reservoir water.

It is the author's hope that the data in this paper will impel engineers to design reservoirs of ample size biologically, as well as hydraulically. Those surface waters are best which are gathered quickly and stored for an ample period in a clean reservoir.

Financial Benefit of Town Planning in England

UNDER the Town Planning Act of 1925, which consolidates the enactments relating to town planning in England and Wales, local authorities are authorized to recover from any person whose property is increased in value by the making of any town planning scheme, one-half of the amount of that increase.

In addition to this provision whereby the community may share in the benefits conferred on property owners by its town planning activities, there is a provision whereby persons whose property is injuriously affected by the making of a town planning scheme may obtain compensation in respect thereof from the responsible authority. Compensation is not to be paid, however, on account of buildings erected after the adoption of the plan. The act also provides that "property shall not be deemed to be injuriously affected by reason of the making of any provisions inserted in a town planning scheme which prescribe the space about buildings or limit the number of buildings to be erected, or prescribe the height or character of buildings, and which the Minister, having regard to the nature and situation of the land affected by the provisions, considers reasonable for the purpose."



THE BOOK CARAVAN IN MONROE COUNTY, N. Y., IS A WELCOME VISITOR

The County Library

What It Will Do If Properly Organized and Supported:

(1) It will give every library in the county the guidance, assistance or service of a trained librarian. Merely in the provision of a county librarian, it will greatly advance the general library interests of the county.

(2) It will greatly improve and increase the services of all the weak libraries now existing in the county. New life and efficiency will be given to many local libraries now barely maintaining existence. Double value will be given to past investments in these libraries.

(3) It will make every schoolhouse a center for distributing good books to the surrounding population.

(4) It will bring to every home where there is the desire for them, a great variety of good books, new and old—not merely the few that may be in the local collection, but any books belonging to the entire county system or obtainable in the great State Library at Albany.

(5) It will furnish expert aid in selecting for every school and study club, the books that are especially suited to its needs; also, in bringing into every locality the books that are of special interest to that locality.

(6) It will enable any one in the county, no matter where he lives, to continue his education after leaving school, by means of reading courses and books selected and provided for his or her particular needs.

(7) It will be an important ally and aid in the work of every civic organization in the county, granges, farm bureaus, civic clubs, churches, Sunday schools, public schools, etc., bringing to each of these the best books relating to their work and interests.

(8) It will mean a great economy for every reader in the county, bringing him books and periodicals for which he would have to pay from $5 to $50 if provided by private purchase, at an annual average cost of 75 cents or, at the most, $1.

(9) It will make strongly for equality in privilege and opportunity between residents of rural districts and of cities, thus adding to the attractions of rural life.

How Much It Is Needed:

(1) After 50 years of legislation in New York State for free public libraries and after 90 years of state effort to bring good books to the people of the rural communities and rural school districts of the state, there is to-day a population of 1,200,000 without any public library facilities or privileges.

(2) There are numerous small libraries in nearly all the counties which are just barely able to keep alive, quite too weak to function with any degree of efficiency, which may become very effective units in a county system. For the full fruition of the efforts, gifts and sacrifices that have been made to bring these

little libraries into existence and keep them alive, there must be a county library system.

(3) No system of rural library service can be complete without a book wagon or automobile. That is a natural part of a good county library, and practically impossible without it.

(4) The county library is needed to insure any adequate returns, in the matter of education, for all the present enormous expenditures on district schools.

(5) Little libraries operating independently can never provide for the unusual person or the person having exceptional book wants. In a county library, each such person will have available any book or books in the entire county system.

What the Local Library Institute Groups Can Do for the County Library:

(1) Become thoroughly informed, both as to its advantages, and as to the state laws regarding its establishment and operation. At each meeting these laws may well be presented and explained.

(2) Organize for the county or counties represented at the meetings, standing committees of three or five members to have this particular development at heart, such committees to be ready to move in every practical way for advancing the county library idea in their counties, presenting the cause as effectively as possible to their county board of supervisors, the home bureau, farm bureau, granges, Red Cross committees, women's clubs, and other civic organizations within the county. In some cases, an exhibit or other means of publicity at the county fair will be worth while.

(3) Pass resolutions, if the local group is really convinced and in earnest in the matter, commending the plan to county boards of supervisors and strongly urging further action and aid by the state in its interest. Further help may be given by resolutions appealing to all the above-named county organizations to cooperate with the county committees in promoting the plan.

What the Individual Librarian and Library Trustee Can Do for the Cause:

(1) Learn as much as possible about it.

(2) Make it a leading topic for discussion at one or more of the regular meetings of the library trustees. If possible, put the trustees on record in its favor by a formal resolution.

(3) Talk about it fully as occasion may offer, with persons of influence in the community; give them literature on the subject. Go before various local clubs and associations and give talks or demonstrations as to its advantages, telling how it would work in their community or their county. Get resolutions in its favor from as many as possible of such groups of citizens.

(4) Call on the Library Extension Division of the state for practical help wherever a favorable situation seems to exist for promoting the cause.

ACKNOWLEDGMENT.—From *New York Libraries*, published quarterly by the University of the State of New York, Albany, N. Y.

THE CHILDREN IN BIG FLATS, N. Y., ARE EAGER PATRONS OF THE CHEMUNG COUNTY LIBRARY

The Municipal Index

That libraries are appreciating the importance of this yearbook is indicated by the fact that the American Library Association includes it in a recent number of "The Booklist," commenting on it as follows:

"A useful reference book published annually containing a great amount of practical information on municipal activities and development for the year."

The 1926 Municipal Index will soon be issued.

The Year's Progress in Street Lighting

Important Report from Transactions of the Illuminating Engineering Society

THE Joint Committee on Street Lighting of the New York Conference of Mayors and other City Officials and the Empire State Gas and Electric Association in its report pointed out that "the trend of modern street-lighting practice is very definitely toward the use of more attractive installations and large light sources." The Conference suggested that each municipality adopt a street-lighting plan and program for the entire city to be followed in all new installations or changes in old ones so that the results would be harmonious and consistent and not dependent on the enthusiasm and civic pride of various local groups in different parts of the community. Such a plan should take care of the question of adequate illumination for the various classes of thoroughfares, thus avoiding the whims of certain districts in the way of light intensity and types of equipment.

Highway Lighting

The increased use of auto trucks for freight transportation has stressed the importance of highway lighting, which is receiving considerable attention. Highway illumination was considered an important factor in lessening traffic accidents, by the Joint Committee on Street and Highway Safety under the leadership of the Secretary of Commerce and Labor. It found that the Pacific Coast states were making rapid progress in illuminating highways. California is planning a highway-lighting system for the route between Los Angeles and San Francisco for the purpose of diverting truck traffic from day to night. Michigan leads other states in respect to highway illumination. The United States Bureau of Public Roads is recommending further developments on the subject.

Street-Lighting Practice in England

At the General Meeting and Conference of the Institution of Public Lighting Engineers and Superintendents held at Glasgow, Scotland, September, 1924, papers on the street lighting in Glasgow were delivered, dealing also with projected lights and visibility in their relation to street lighting. English practice may be inferred from a perusal of the papers and discussions. It is pointed out 'that street lighting has a psychological criterion. It is this psychological element, together with other incalculably variable factors, that forbids the circumscription of the street lighting into a few formulae. Standardization for the sake of efficiency and economy is one of the prime needs of street lighting. . . . Fortunately, general methods can be suggested for street lighting in any normal streets. . . ." Statistics for street lighting have been collected from over 100 county and metropolitan boroughs and districts in England, including all classes of streets and roads, covering 5,675 miles lighted by 190,000 gas lamps and 2,092 miles lighted by 70,600 electric lamps, thus showing that over 70 per cent of the street lighting in that country is by gas. In the case of electrically lighted streets, the spacing averages 29 lamps to the mile or 180 feet apart, and in the case of gas 34 to the mile or 155 feet apart. In 90 per cent of the streets lighted by either illuminant the illumination is produced by lamps ranging in candle-power from 10 to 50, mounted from 10 to 12 feet high, with a minimum horizontal illumination of less than 0.0015 foot-candles and ranging up to 0.003 foot-candles. Of course, exceptions to these divisions exist all over the country.

Schedule of Burning Period for Street Lamps

Information on the schedule of burning periods for street lamps is given in the following table:

City	Burning Hours per Year
Baltimore	4,000
Cincinnati	3,914
Cleveland	4,000
Dayton	3,940
Detroit	4,040
Philadelphia	4,090
Rochester	3,984
Chicago (gas)	4,151

Street Lighting on the West Coast

The last year has seen a decided change in the street lighting of the closely built-up and older portion of the city of San Francisco, in which prior to that time more than 50 per cent of the area was illuminated by the boulevard type of gas lamps. These are being replaced in both sections by tungsten lamps of 250 to 600 candle-power in refractor units suspended from brackets attached to line poles. The larger candle-power lamps are installed at the street corners, the smaller lamps in the middle of the block. In newer tracts opened for development, the promoters are required

to install street lighting which has received the approval of the city authorities.

Additions to the ornamental system on Hollywood Boulevard, Los Angeles, bring the number of miles lighted to three, with 354 twin-lamp standards in use. It is planned to cover five other sections of the boulevard, utilizing an additional 823 standards, making a total of 1,177. Only one-fourth of these lamps are used after midnight. Arrangements have been made for replacing the old five-light cluster standards on three miles of main streets in Alhambra, Calif. Two hundred and thirty-eight standards are involved, each carrying two ornamental torch-type holders with medium alabaster rippled glass globes containing 6,000-lumen lamps. The standards are 17.5 feet to the light center and are spaced opposite each other on 135-foot centers. Equipment is provided so that in case of accident to the standards the wires are disconnected from the circuit. The system is wired so that at midnight the lamps on alternate posts are turned out, leaving a system still balanced.

The Middle West

A new white-way lighting district has been created in Salt Lake City. The installation will be similar to previous ones. New street-lighting systems have been installed in Evanston, Wyoming, and Minidoka, Idaho. During the last five years nearly 1,000 ornamental standards have been erected for street-lighting purposes in Pueblo, Colo., so that at present about 37 miles of streets are illuminated. In the commercial district five-light Corinthian columns are employed. Four standards are placed 90 feet apart on each side of the street. In the residential section two types of posts are found, five-light and single-light, the former on streets with center parkways. A white-way system has been installed in Libertyville, Mo. It consists of twenty-four 4,000-lumen gas-filled tungsten lamps on single-unit ornamental posts. The average spacing is 65 feet and the mounting height 12 feet 6 inches.

Central States

An increase in the lighting of Chicago's streets, mainly in the residential district, has been made in the last year. On December 31, 1924, the total municipal electric street-lighting system comprised 28,207 100-candle-power units, 28,494 600-candle-power, 1,859 250-candle-power, making a grand total of 58,560, an increase of 2,212 over the number at the end of 1923. The 600-candle-power units are used in the business and industrial districts and in some residential locations. In most cases, these light sources are at a height of 22 feet, and those attached to trolley poles have a mounting height of about 19 feet and those mounted on the "Chicago Beautiful" ornamental standards have a height of 25 feet. About one-third of the 100-candle-power units are of the 4-ampere series type used to light the residential districts. They are spaced two on diagonal corners, one at street and alley intersections, and additional lamps staggered to give one for each 75 feet of street. Converted gas posts are used for standards, the light height being 9 feet 6 inches. A 14-inch spherical diffusing globe encloses the lamp. The other 100-candle-power units are of the 6-ampere series type mounted on cast iron ornamental posts at a height of 10 feet 6 inches. The 250-candle-power units are also used in the residential district, mounted on concrete posts with their light height 12 feet. The globe is of rippled glass, and the spacing is as before, except for the distance, which is 150 feet. In addition to the three types of lighting mentioned, the department also has in operation 154 1,000-candle-power units used around the City Hall, at the approaches of bridges and for special white-way lighting. Three hundred and thirty-eight 400-candle-power lamps have been installed for a similar type of lighting in another section of the city. For outlying streets not provided with electricity but having gas-mains, gas lamps are placed, generally two on each street intersection, averaging one for each 125 feet of street. The standard gas lamp used is of the single inverted type 50-candle-power rating, consuming approximately 3 cubic feet per hour. There are some 40-candle-power and some double-mantle units. The total number of gas lamps in use at the close of 1924 was 4,512 and there were approximately 5,500 gasoline lamps in locations in which neither gas nor electricity is available. In addition to all the foregoing, reference should be made to some 11,000 electric lights, in sizes ranging from 25 to 75 watts, used to light the 761 subways where streets go under railways, viaducts, the lower decks of bridges, etc. The railways entering the city employ some 400 lamps of their own to light grade crossings.

In Indiana a movement is under way to secure the enactment of a law to provide for the lighting of main highways. An experimental line has been built out of Richmond with special highway lighting units installed on poles 400 feet apart. A new system in Indianapolis will affect about 40 miles of

streets, increasing the illumination in the down-town district 20 times and in the main arteries 10 to 12 times. About 2,300 standards and 3,000 pendant units will be installed. In the business section twin lamps on ornamental standards will be placed, carrying medium alabaster rippled glass globes enclosing 15,000-lumen, 20-ampere incandescent lamps. They will be placed opposite each other at 105-foot intervals with a mounting height of 20 feet. In the residential and less-traveled section the new installations will consist partly of uniform standards and partly of pendants. The standards will carry alabaster light rippled globes with 6,000- and 4,000-lumen lamps spaced at intervals of 125 feet opposite, with a 12-foot mounting height. The pendant units will have light alabaster rippled globes using internal dome refractors equipped with either 6,000- or 10,000-lumen lamps. Six thousand of these will replace flame arcs.

In a brief history of the street lighting of Detroit it has been stated that the cost per arc for street lighting has been steadily going down as a result of the reduction in the cost of fuel, the increased efficiency in the manufacture and distribution of power, and a decreasing cost of electrical apparatus necessary for the lighting of streets. This city, which now covers an area of more than 104 square miles, has not been able to finance all the requirements for street lighting, and for this reason no attempt has been made to provide any display of white-way lighting. During the last year, 1,344 additional lighting units had been fitted up. The total number of lamps in service includes 17,112 arc lamps, 84 60-candle-power series incandescent lamps, 238 100-candle-power series incandescent lamps, 91 250-candle-power, 130 400-candle-power, 173 600-candle-power incandescent lamps, and 31 200-watt multiple lamps, making a total of 17,859 units. It is believed that this installation of luminous arc lamps is the largest of its kind in the country.

The inadequacy of the street-lighting system of Kalamazoo, Mich., in 1922 led to a thorough study of the subject and resulted in a new installation which has increased the illumination of the streets 2.5 times. The old system consisted of approximately 650-4 ampere magnetite arcs. Photographic tests to determine units to be put in the new system were made, using as a criterion the illumination of a surface tilted 15 degrees from the vertical and 5 feet from the ground, it being assumed that vehicle drivers are more interested in seeing the street obstructions than the street surfaces. As a result of these tests, four-way and two-way refractor units with totally enclosing dust- and bug-proof globes were adapted and fitted with 2,500-lumen gas-filled tungsten incandescent lamps. These numbered 673. There were 198 cylindrical bowl refractors fitted with 1,000-lumen lamps put in where the others were not feasible. The units were mounted on mast-arms formerly employed as supports for arc lamps, the sides being about 22 to 24 feet, and the longest arc being 14 feet. A program of improvement calls for the addition of 25 new lamps per year. The new system was described in the December, 1925, issue of THE AMERICAN CITY.

On one of the main thoroughfares of Cleveland 225 2,500-candle-power electric incandescent lamps will be placed. They are said to be much larger than any other incandescent lamps heretofore used for street lighting, and will be enclosed in large suspended lanterns. The report of the committee which carried on the Columbus, Ohio, street-lighting test has been issued. It has three rather unique features: first, clarity of statement in outlining the general requirements which would solve the problem; second, the use of "watts per linear foot of street" as the unit of measurement; and third, visibility stressed as the most important requirement in street illumination.

Norwood, Ohio, a municipality adjoining Cincinnati, has put in a street-lighting system using 120 ornamental cast iron posts of a design which has been adopted as standard for all new street-lighting systems in Greater Cincinnati. The posts are spaced 80 feet apart, have a light center height of 12 feet 6 inches above the sidewalk, and carry one 20-ampere gas-filled tungsten lamp operating on a transformer located at the side of the post. The glassware developed especially for Cincinnati consists of two parts, the globe and the canopy, both of diffusing glass and assembled as one unit by an ornamental band, the canopy being arranged with a watershed which keeps the rain off the globe. A new globe holder facilitates removal and cleaning.

The Southern States

A system of intensive white-way illumination has been installed throughout 1.5 miles of the business section of El Paso, Texas. Two hundred and forty-four luminous arcs of the 6.6-ampere size with high-efficiency electrodes mounted two to a standard, 21 feet above the road surface and staggered, are expected to provide an illumination between 450 and 500 lumens per foot of street lighted. A considerable increase in the real estate value has been coordinate with the electric installa-

tion of a new street-lighting system in Florida. The lighting units have alabaster rippled glassware with dome refractor.

The Eastern States

At scattered locations throughout Philadelphia, 812 additional arc lamps have been placed during the last year. In the same period 7,500 arc lamps have been changed over to 600- and 100-candle-power incandescent lamps. There has also been an increase of 246 gas lamps and 373 gasoline lamps. Plans for the Sesquicentennial celebration to be held during 1926 call for ornamental illumination of the main arteries of the city. More than 500 city blocks will be decorated with standards averaging eight to the block, bearing colored lamps of high candle-power. They will serve as guideposts to the city. Triumphal illuminated arches are planned for the urban "gateways."

Under the direction of the Engineer Commission of Washington, D. C., a committee on the lighting needs of the city, consisting of city engineers, architects, and illuminating engineers, was appointed. After an extensive study, a report has been submitted classifying all streets considered according to the lighting standards and recommending desirable illumination for each class. Designs of lighting units and standards were also prepared and accepted which provide a complete and harmonious street-lighting design for the entire city. The lumens per foot will range from a maximum of 275 to a minimum of 8, with provisions for increased lighting intensity if found desirable in the future. Tungsten filament lamps varying in size from 250- to 600-candle-power will be employed, together with some ornamental arc light units in the downtown section.

The first in its district to have a white-way system, Mamaroneck, N. Y., has replaced 80-candle-power units with those of 400-candle-power. The installation includes 89 lamps in the globes of the canopy and dome refractor types, spaced parallel along the street 110 feet apart. The units are 13 feet, 6 inches above the ground, on brackets attached to wooden poles. The new street-lighting installation on Erie Boulevard, Schenectady, was described in THE AMERICAN CITY, in the October, 1924, issue, page 341. The little village of Central Bridge, N. Y., which is the birthplace of George Westinghouse, is now basking in the light of its first electric street-lighting system. Thirty-five lamps have been installed. A general celebration inaugurated the street-lighting system of Attleboro, Mass. All-night lighting has been adopted for the first time in the history of the city.

The following table gives the number and style of lights in the city of Boston.

No.	Style
5753	Series Magnetite.
2032	40-candle-power series incandescent.
1416	40-candle-power multiple incandescent.
851	60-candle-power series incandescent.
531	60-candle-power multiple incandescent.
11	100-candle-power series incandescent.
22	100-candle-power multiple incandescent.
25	200-candle-power series incandescent.
11	700-candle-power multiple incandescent.
23	1100-candle-power multiple incandescent.
9713	Welsbach single-mantle 60-candle-power gas.
142	F. A. Welsbach single-mantle 60-candle-power gas.

Population Growth Brings Americanization Problems

ACCORDING to a city census recently taken in Detroit by the Board of Education, the 1925 population of that city was 1,242,044, as compared with 993,678 in the Federal census of 1920. In commenting on conditions disclosed by the new count, the *Detroit Educational Bulletin* for November, 1925, says:

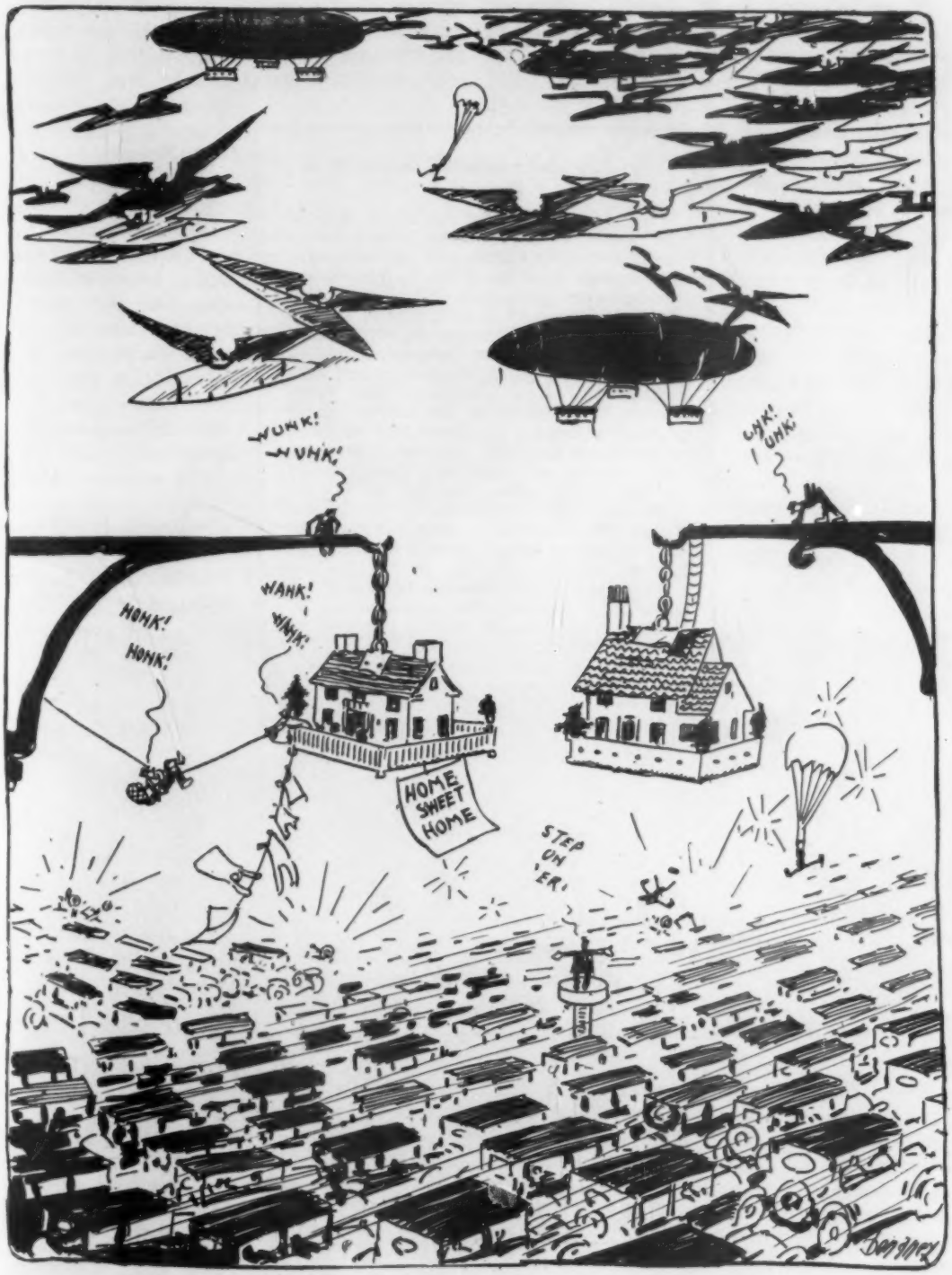
"Not only does Detroit grow larger, but it accelerates in complexity. The tabulation and analysis of the census total list 41 nationalities, ranging from 679-872 for the United States and 115,099 for Poland as the two largest divisions, to 174 for Portugal and 137 for Arabia as the two smallest groups. This leaves nearly half a million that are distributed among the 37 nationalities. For those of us who as school officials and teachers hold the most important trusteeship for future Detroit, this census fact again serves to emphasize the importance of taking account in instruction of group and individual differences. That this duty is not being neglected in our schools is indicated by our x, y, z classifications and by the wide range of instructional material that provides for self-motivation, for self-appraisal, and for progress at individual rates. The proper education of the children of Detroit's polyglot population calls for a large measure of ingenuity, patience, and forbearance.

"The census analysis should be studied particularly by all our Americanization forces. There are 48,888 men who are not citizens and 11,170 more whose citizenship status is unknown. Among the women of Detroit, 39,636 are not citizens and 13,264 are in the unknown category in this respect. The per cents for men and women not citizens are 7.8 and 11.7, respectively. The children show 41,119 not citizens and 11,926 unknown.

"Summing up the whole matter of the last paragraph, 19.5 per cent of Detroit's adult population are not citizens, and the citizenship status of 6.8 per cent more is not known; 8.1 per cent of the children are not citizens and the citizenship status of 2.3 per cent more is not known. The lay reader is unable to tell whether or not these statements mean progress in the important matter of Americanization. The experts have in the census analysis material that they should carefully weigh."

Will It Come to This?

A Cartoonist's Suggestion of What May Happen If Uncontrolled Growth Continues in Our Great Cities



Cartoon by Donahey—Courtesy of the "Cleveland Plain Dealer"

Standardizing Our Automobile Drivers

By F. A. Moss

THERE are two main elements in the traffic problem: the purely inanimate, including the machine and the highway on which it operates; and the animate or human element that controls the operation. The first of these elements has been given a lot of consideration by the traffic engineer, while the second is practically an untouched field. The civil engineer has done a great deal to make the highways as such safer. He has removed the more dangerous curves, widened the road-bed, reduced the number of grade crossings, and generally increased the road capacity. The mechanical engineer has likewise contributed his quota to making the world a safer place in which to drive. He has standardized requirements for such important mechanical elements as brakes, lights, and steering apparatus. He has developed all kinds of safety devices to make sure that an accident will not be due to some defect in the machinery. In making his machine, lock-washers and cotter-pins are used freely to insure that the nuts will stay where he puts them. Unfortunately the human engineer has no lock-washers or cotter-pins to hold the human "nuts" in the proper position, the result being the wrecks we read about daily. Analyses of the causes of accidents attribute over ninety per cent of all accidents to the human factor and less than ten per cent to the purely physical factor.

Both the civil engineer and the mechanical engineer have done a fairly good job. Their work at the present stage is at least eighty per cent perfect, which means that in these fields further progress will be slow and expensive, and before long the stage of diminishing returns will be reached. Not so with the human engineer. Except in a few isolated cases, little attention hitherto has been given to the human side of the traffic problem, the result being that the traffic increases and the problem remains unsolved.

The various automobile dealers and manufacturers take care that their machines are up to standard before they are turned loose on the streets, but there are unfortunately no such dealers or manufacturers to insure a standard performance in the driver of the machine. Less than one-fourth of the states even go through the formality of examining drivers at all before entrusting them with this potential death-dealing machine. It seems impossible that such should be the case. And the worst of it is that in the few jurisdictions where they go through the motions of examining before granting a license, the examinations given are quite inadequate and of very doubtful value. So long as the jurisdictions limit their examinations to a few superficial questions designed to find out the applicant's information about local traffic regulations, such as "Is Fourth Street a one-

Tests to Determine Efficiency of Drivers

The part played by the automobile in the world to-day is of such tremendous consequence that more and more thought and money must be given to preventing accidents and increasing driving efficiency. Each day we read of automobiles smashing into bridges, running through storefronts, tearing down lamp-posts, dropping over precipices, mutilating and killing people. It is estimated that every twenty-five minutes of the day and night a fatality occurs as the result of some automobile accident. During the nineteen months of America's participation in the World War, the loss of life by highway traffic accidents in the United States is estimated to have been nearly twice as great as our loss of life through the war itself.

With the traffic problem becoming increasingly difficult, the question as to what can be done for public safety is of steadily growing importance. The suggestions in the accompanying article merit special consideration, since its author, Dr. F. A. Moss, head of the Department of Psychology at George Washington University, Washington, D. C., is also secretary of the Committee on the Causes of Accidents of the Hoover Conference on Street and Highway Safety, and a member of the Sub-committee on Driver's Tests of the National Research Council. These organizations are cooperating in developing tests along the lines mentioned in this article. The tests to determine the average reaction time of drivers were conducted by Dr. Moss in cooperation with H. H. Allen, Assistant Mechanical Engineer of the United States Bureau of Standards.

way street?" or "At what speed are you allowed to drive on K Street?" just so long shall we find the same motley crowd making up our driving public. If we hope to reduce accidents by improving the quality of drivers, it is evident that we must steer clear of such insignificant questions as those just quoted, and develop tests that will bring out the real traits of those most closely concerned with the traffic situation—the drivers themselves.

As pointed out above, it is no longer a matter of opinion whether a steel beam can withstand the stress and strain that follow its being placed in a highway bridge over which the floods of traffic must pass, but it has not been determined whether the automobile driver can stand up under the stress and strain of steering his machine through this same flood of traffic. The construction engineers have arrived at their knowledge about the steel beam by substituting numerical facts for opinions, reliable units of measure for mere guesswork. The tests described below yield their results in numerical measures, however crude and coarse they may be. With the perfection of these methods it is reasonable to expect that the human engineer, like the construction engineer, will be able to measure the strength and quality of the materials with which he deals, and to state with a fair degree of accuracy the probable competency or lack of competency of prospective drivers.

Nearly all jurisdictions have certain definite standards which the automobile itself must meet before it can be operated. Among the minimum qualifications which the automobile must possess are found the following: "The brakes must be capable of stopping a machine going at a speed of 20 miles an hour in a distance of 50 feet"; "The lights must be of sufficient candle-power and must be so adjusted as to illuminate an object 200 feet ahead." But in no jurisdiction do we find requirements stating that before a man can qualify to operate a machine he must be able to move his foot from the accelerator to the brake within a specified time, or that his vision must be such that he can see clearly the object 200 feet ahead when his lights have properly illuminated it. Yet the last two requirements are just as important as, or more important than, the first two.

Moving the Foot from the Accelerator to the Brake

In order to determine how much time it takes for the average automobile driver to move his foot from the accelerator to the brake and to begin to apply it, a series of experi-

MEASURING THE DISTANCE BETWEEN RED SPOTS TO DETERMINE HOW QUICKLY AN INDIVIDUAL CAN ACT IN AN EMERGENCY

By means of the pistols, which can be attached to the running-board, a shot is fired by the examiner when the car is moving at the desired rate. This serves as a signal for the driver to move his foot from the accelerator to the brake, which action fires the second pistol. Each pistol leaves a red spot on the road, and the man's score on the test is obtained by taking the ratio of the distance between the spots to the speed at which the car was moving when the pistol was fired

ments was conducted by the writer in cooperation with H. H. Allen of the United States Bureau of Standards.

The apparatus used in the test consisted of an automobile with two revolvers mounted on the under side of the running-board. The revolvers were loaded with red lead, so that when either was fired a bright red spot was made on the road. One revolver was fired by the examiner as a signal for the person taking the test to move his foot from the accelerator and to apply the brake just as if an emergency were about to occur. The second revolver was fired automatically when the person taking the test first touched the brake pedal to begin to apply it. In order to make the results as accurate as possible, a chronometric tachometer was used instead of the ordinary speedometer to indicate the speed at which the machine was traveling when the two revolvers were fired. By measuring the distance between the two red spots on the road, and by dividing it by the speed at which the driver was going when the shots were fired, it was possible to determine how much time elapsed between the hearing of the signal and the initial motion toward applying the brake.

The average reaction time of those tested was slightly more than one-half second. If a driver with a reaction time of one-half second were traveling at the rate of 30 miles per hour, he would go approximately 22 feet after hearing the signal before he began to apply the brake, whereas a driver with as slow a reaction time as one and one-half seconds would go 66 feet before beginning to apply the brake. It should be borne in mind that this time does not represent the time required for the brake to stop the machine, but is the time that elapses before the driver even puts his foot on the brake. From the foregoing it will be seen that, even though a machine had the finest set of brakes possible, the driver could not even begin to stop it in the 50 feet allowed at a speed of 20 miles per hour if he happened to have a one-and-one-half-second reaction time.

Testing the Judgment of the Driver in Emergencies

Not only should the driver be required to meet some minimum standard of reaction time in an emergency, but he should have to fulfil certain minimum requirements in judgment dealing with driving problems. He should be capable of judging the best method of handling situations which come up in operating a machine. It seems possible to measure his judgment by some such method as that employed by the writer in a series of tests given to the Motor Transport Corps at Camp Holabird, to the Philadelphia Automobile Club, to a number of taxicab drivers, and to about three hundred students of George Washington University. One test consisted of fifty problems which often confront the automobile driver. The following will give some idea of the type used, although these particular problems were not used. To each problem four answers are suggested, only one of which is right. The person taking the test is to indicate by a cross the answer which he considers correct.

If you are driving along beside a street car which stops to unload passengers at a station without a loading platform or safety zone, and if you have already passed the rear door but not the front door when the car stops, you should:
———Back up ten feet behind the rear door and stop.
———Stop immediately and remain at rest until the street car moves on.
———Pass on slowly, exercising great caution.
———Advance the throttle and get out of the way.

When you sell your car, which of the following should you do with your license tags:
———Give them to the buyer.
———Throw them away.
———Return them to the license bureau.
———Send them to the nearest garage.

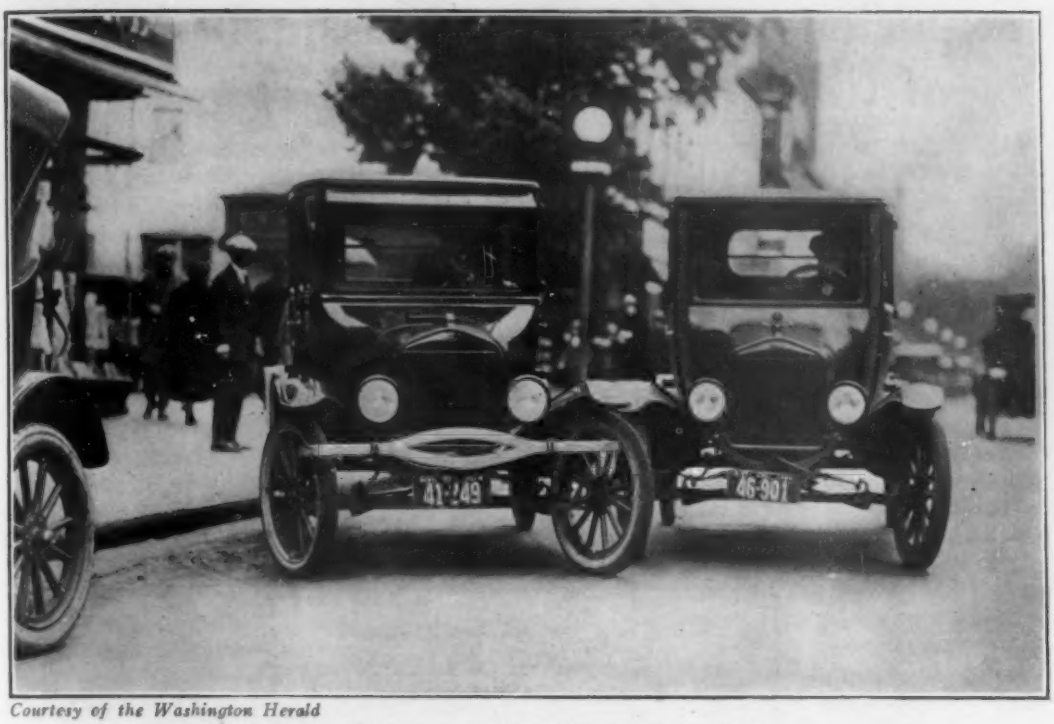
If you have started to pass a moving automobile and notice a closely approaching automobile from the opposite direction you should:
———Blow your horn and go ahead.
———Increase your speed and cut in ahead quickly.
———Stop where you are.
———Slow down and follow the automobile ahead of you.

By some such device as this it is possible so to measure the mental requirements of an applicant for license that, regardless of where, when, or by whom the tests are given, the standards can be maintained. Another advantage of this type of examination is that it can be used to test sixty or seventy-five at one time, and in that way a large part of the examiner's time can be saved for conducting the road test.

Photographs and Road Tests

Another type of test which seems to be worth some consideration is designed to measure the individual's ability to recognize dangerous situations as presented in photographs. The test consists of a number of photographs of situations which are generally recognized to be dangerous, and the task of those taking the test is to indicate the dangerous element in each picture. The photograph on page 49 will show the nature of the test.

In practically all the jurisdictions where any sort of examination is required for the licensing of drivers, some form of operating or road test is included. In most cases this consists



Courtesy of the Washington Herald

LEAVING THE CURB WITHOUT SIGNALING

One of the photographs used in a test for recognition of dangerous situations. After examining the photograph, the person taking the test indicates "what is wrong with the picture"

simply in having the applicant drive around the block. In cooperation with the officials of the District of Columbia, more definite specifications for the operations to be included in this type of examination have been devised, and in this way it is possible to hold all applicants up to the same standard so far as operating is concerned. Among the things required of all applicants are: making a left turn in traffic; stopping and starting on a hill without killing the motor; and parking in a space parallel to the curb as if between two other machines, the space allowed for maneuvering being ten feet in addition to the length of the car. The applicant's performance on each of these tasks is rated in determining whether or not he shall receive an operator's license.

That we should have better defined physical requirements such as the quality of front and side vision, auditory acuity, and other physical requirements before granting the individual a license is generally admitted. Without doubt, much more work will be done in the near future on this part of the problem.

West Virgina Cities Authorized to Charge Part or All of Paving and Sewerage Costs Against Abutting Property

IN a recent bulletin the West Virginia Municipal League calls attention to amendments adopted by the 1925 Legislature to the state code relating to methods of financing street paving and sewerage systems. It appears that all West Virginia cities, towns and villages of more than 1,000 population (with the exception of certain municipalities having special charters) may now pave their streets, alleys, etc., and put in complete sewer systems, and pay for them (1) either by direct taxation upon all the property of the city or (2) by issuing bonds for that purpose; or they may (3) require the property owners to pay for two-thirds of the paving assessed against their property; or they may (4) require the property owners to pay for all the paving or sewering, or both, under the "certificate plan."

Under plan number 4, the certificates may be issued only as the council, by three-fifths vote, has declared the necessity for such improvement, but no such resolution shall be passed until thirty days' notice has been given all abutting property owners of such contemplated action. Such certificates when issued do not constitute an indebtedness against the city, town, or village. They may be sold to the contractor doing the work or to any other person or persons at a discount of not more than 5 per cent of the face value of the certificates. Full provision is made for the manner in which these certificates of indebtedness may be collected by the contractor or other person or persons in possession of them.

Experiences with the Assessment Method of Financing Main Pipe Extensions

By Caleb Mills Saville

Manager and Chief Engineer, Board of Water Commissioners, Hartford, Conn.

NO one can reasonably deny that the extension of the public water-supply into new territory is of special benefit to that locality. How this extension shall be paid for is a problem that has vexed most water-supply officials, and it is one which will not down, but is continually in evidence. There are two distinct phases of this question, namely, whether it is approached from the view-point of the privately owned water-supply company, or whether it is seen from the angle of the municipally owned and operated system.

The Case with Privately Owned Water-Works

In the case of a privately owned water-supply company, the extension is a capital expense and should be met from income, preferably, of course, from surplus. Sound bookkeeping allows the use of the depreciation fund for this purpose, provided the money is borrowed from that fund as from any source and interest paid for the use thereof. This source of funds is available to privately and to municipally operated plants.

With municipally operated plants, theoretically at least and usually practically, there is no surplus where the works are run at cost. The stockholders, who are the water users, take their dividends as long and as often as possible in low rates. If all water income is turned into the municipal treasury, the usual way to meet the cost of capital expense is by direct appropriation from the tax levy or from bond issue for the specific work.

Guarantee Method

If the water department handles its own funds, there are two methods in ordinary use at the present time. In the guarantee method developers of property promise a certain return to the department in water rent or otherwise if the pipe is laid. There are many pitfalls in this method. The guarantee is usually personal and the guarantor may move away. All of the property owners on the street may not be willing to sign, but as it is a public pipe, they have certain rights that cannot be denied, even if they are not holden for the initial expense of the installation. Whether connected or not, the property has been greatly benefited by the installation at no cost to the owner. To avoid this inequality and as nearly as possible collect from the beneficiary for value received, the method of assessment for main pipe extensions seems to be the more equitable one for all concerned.

What Is a Special Assessment?

A special assessment "is a local assessment imposed occasionally, as required, upon a limited class of persons interested in a local improvement who are assumed to be benefited, and it is imposed and collected as an equivalent for that benefit and to pay for the improvement." (City of Bridgeport, Conn. vs. N. Y., N. H. & H. R. R., 36 Conn. 225, 262, 263, Am. Rep. 63.) "The foundation of special benefits for public improvement is the special benefit derived by owners of property over and above the rest of the community." (Newell vs. City of Cincinnati, 450 s. 407, 424, 15 N. E. 196—1887.)

Experience with Assessment Method in Hartford, Conn.

After a long and somewhat trying experience with the so-called guarantee system of financing main pipe extensions, under authority of a legislative act, the Board of Aldermen of the city of Hartford, Conn., approved an ordinance providing for the assessment of benefits from main pipe extensions. This method of financing has worked out very satisfactorily in Hartford and there are few persons who would be satisfied to return to the former method.

The initial step toward installing a main water pipe in a new location is for the proponent to present a petition to the Board of Water Commissioners. After arguments are presented for and against the proposition, the Board takes the matter under advisement and determines whether public necessity and convenience require the extension. This consideration is based on the relationship to convenience and necessity rather than on the cost

of the work or even the means available for doing it.

After a petition is received, the records regarding the property are examined and a plan prepared showing all lot owners affected on each side of the street. All owners are notified of the proposed hearing, which is also advertised in the newspapers. As it would be manifestly unfair to assess both frontages on a corner lot for the full amount of the assessment, by vote of the Board an exemption of 75 feet is made when a pipe is laid past the second side of a property. Even this exemption is the subject of considerable controversy and at times seems to bear heavily upon the owner of such property. It is sometimes hard to convince owners of long, narrow lots, on streets meeting at acute angles, of the justice of the assessment, but in the end it is surprising how few real protests are allowed to continue after the matter is thoroughly explained and the good to the greatest number stressed.

The assessment method of financing main pipe extensions is generally conceded to have been a boon to real estate development, as it places the cost of the improvement equally on all property along the street and, being added by the developer to the price of the land, results in little or no hardship on the purchaser. At present the maximum rate of assessment is $1.75 per front foot.

As an aid to deciding whether or not public convenience or necessity requires the installation at the time requested, it is the usual custom for the Board of Water Commissioners to assure itself that the resulting income will give a proper return on the portion of the investment made by the Board, which cannot be assessed against abutting property. If the return in water-rates will average 6 or 7 per cent on the portion of the investment borne by the Water Department, a strong factor is at hand for favorable consideration of the request for extension.

In the ordinance under which the work is done, the cost of laying a 6-inch pipe in a given street is used as a basis for assessment on the theory that this size pipe is reasonably demanded for local fire protection. This size pipe, however, is seldom laid, its only use being in short streets fed at both ends, or as a variant on longer streets with no side branches. Up to 600 feet, 6-inch pipe is often laid in the middle and fed at both ends by an 8-inch pipe. This method somewhat reduces the cost to the Department and results in no detriment to the service, as only one hydrant is ever taken off from this section. The maximum length to the hydrant is not allowed to exceed 300 feet, and the hydrant is then supplied from each side.

The ordinary size of pipe, therefore, for residential streets is 8-inch, and this size, of course, is increased wherever required for developments or otherwise. The difference in cost of installation between the 6-inch and the 8-inch pipe is an excess charge to be borne by the Department. In addition, the cost of connections and exemptions at corner lots has to be absorbed in the same way.

Determining Assessment Rate

During the first three years during which the assessment method was used, 1920, 1921, and 1922, the cost of laying 6-inch pipe for the previous year was used as the criterion. In 1922, however, because of several very long lines of 6-inch pipe laid by machine in dirt roads, the cost was extremely low. In 1923 in making up the estimate, it was seen that the result of using the 1922 price under ordinary conditions would be to place a very heavy burden on the department. Because of this condition, the ordinance was changed and the base price determined from the average cost of the 6-inch pipe work for the preceding five years. This gave a price, based on actual costs, of about $2.40 for 1925, to which was added a 25 per cent overhead charge based on 15 per cent on labor cost, which includes general supervision and the use of tools, clerical work, etc.; 10 per cent on material cost, which includes handling, inspection, clerical work, etc.; 10 per cent to the sum of the labor and material cost included as above for general office work, vacations, sick leave, pensions, engineering, etc. In other words, it is the intention to pass on to the abutting owner the proportional cost of all expenses that may legitimately be considered a part of the work from the time it is initiated until its end.

At first, the average cost of the work for assessment and comparison with the base cost was obtained by dividing the total cost of the work by the total length laid and this price per foot applied to the assessable frontage, the Board absorbing the remainder. After a time, however, it appeared that too much of the cost was being borne by the department. The method was therefore changed to that of dividing the total cost by the net assessable frontage. This resulted in placing a greater portion of the cost on abutting owners.

The argument will probably be raised that the water department should stand the whole cost from income, and that when extensions

are necessary they should be made from surplus reserve or from bond reserve redeemed by the department as a whole. As to surplus, the argument is sound if applied to a privately operated company. A municipally operated works, for very good reasons, should have only sufficient surplus to tide it over the lean periods that come to any industry. A surplus in a municipal water department is always looked upon with envious eyes by other city officials; no matter what the safeguards, there is always danger of its being abstracted for other purposes on plausible grounds, and when once gone, it is hardly probable that it can ever be reclaimed.

Use of Depreciation Fund

Theoretically, the depreciation fund does not belong to the Water Department, whether privately or publicly owned. It is a reserve set up by the consumers to pay for the portions of the plant used up in their service, and as such it should be liquid. It is bad business, however, to have any funds lying idle or drawing small interest. This fund may be borrowed by responsible officials for proper investment for capital expense in connection with the improvement of the plant. If it is so withdrawn, however, interest should be paid for it by the department, as would be the case in any loan. In this case the department officials or the directors of the private company, acting for the consumers to whom the funds belong, are acting in a dual capacity, as trustees of the fund for the consumers and directors of the water plant in need of funds. These trustees, if they so choose, can loan the money to the company at a higher rate than a bank would pay on a running account. On the other hand, they, as directors, can borrow this money from the trustees at a lower rate than they would have to pay in the market for these same funds.

This, therefore, seems a good business proposition for the consumers, who are the owners of the depreciation fund until such time as it is required for replacement. In a municipally owned plant, of course, it matters little if this fund is used to a considerable extent to finance additions to the plant, because the consumers generally are the stockholders of the company.

Too High Rates Are Dangerous

On the same argument concerning the danger of too much surplus also hangs the danger in too great incomes or high rates. In the author's opinion, it is best for a municipal plant to keep rates as low as possible and resort to bond issues for payment for additions to plants, in order to spread the cost of the improvement so far as possible over its life, as well as to restrain the almost universal tendency of even the most conservative business men to be less careful of public money than of their own, and also to prevent extravagant outlay, even if honestly proposed.

The handling of large public funds is often entrusted to men who never have had experience with the financial management of private business. Usually the personnel of municipal commissions changes from year to year. Hence, a continuing policy in conduct of work is difficult to maintain and the qualifications of the appointees are usually based on personal or political ground rather than on business acumen, no matter how honest the purpose. Public bond issues, on the other hand, are usually carefully considered as an abstract proposition by independent boards of finance composed generally of men of sound business and financial training, the whole endeavor of whom is to make a good financial showing.

Hartford's water-rates are very low, too low, perhaps, and possibly should be raised in the near future. They are the same that were established 25 years ago—12 cents per 100 cubic feet for the first 3,000 cubic feet per day, and 6 cents per 100 cubic feet for all in excess of 3,000 cubic feet per day. Under present conditions of labor and material costs, it has been impossible to meet the cost of plant expansion directly from income, and resort has been had to bond issues for financing main pipe extensions. One hundred thousand dollars has been so obtained each year for the past three years, and there is authority for the issue of $700,000 more in sums not exceeding $100,000 per year.

The water department sets aside from income $10,000 per year for each $100,000 bond issue. The returns from an investment are paid into a so-called revolving fund, and this will probably be allowed to accumulate until it has reached an amount of about $150,000, or about the amount at present paid annually for main pipe extension work. After this, the bond issue will be stopped and the fund used to finance the work.

Theoretically, if $150,000 worth of work were done each year and all of it came back from assessments, this fund would be sufficient to finance the work in perpetuity. Practically, however, the amount of main pipe work varies from year to year, and—more to the

point—a large proportion of the cost as stated above is paid for directly by the department funds and does not come back in the assessment payments. This means that when it seems best to stop the bond issue and finance from the revolving fund, even increasing annual depletion will have to be made good from income. But income is increasing steadily with the growth of the city and there is an indication of lessening costs of material and supplies at least (municipal labor costs rarely recede), and, more to the point, the call for extensions seems to be lessening as building operations are catching up with the demand.

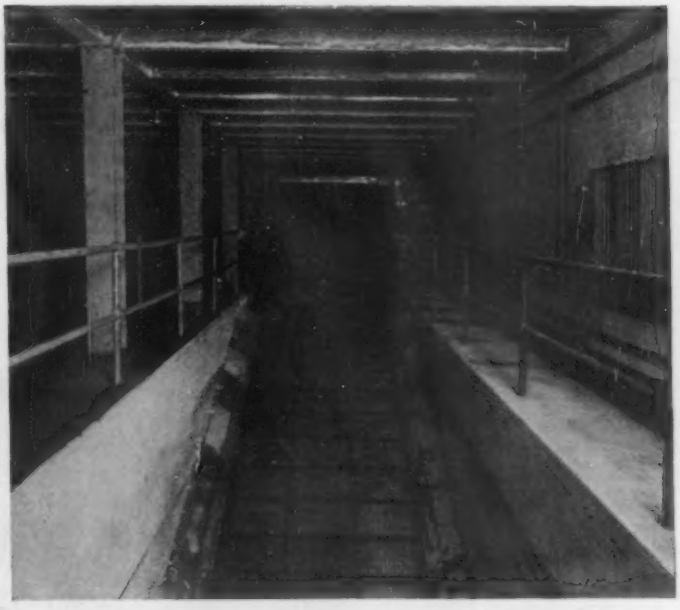
ACKNOWLEDGMENT.—From a paper read before the New England Water Works Association, September, 1925.

The Canal Street Sewage Treatment Plant of New York City

Another Step Taken to Clean Up New York Harbor

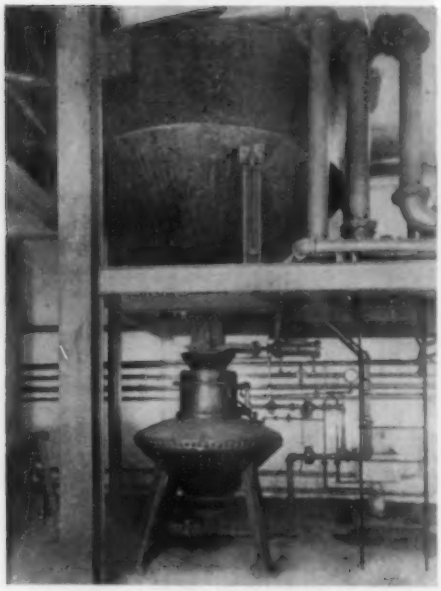
AN ingenious sewage treatment plant that will at least remove some of the grosser solids from the Hudson River and New York Harbor, thus decreasing the pollution caused by sewage disposal by dilution, is now in operation at the foot of Canal Street on the Hudson River, New York City. Like numerous other recent enterprises in New York, this plant, through lack of space, has been crowded down under the street level; in fact, it is not easily discovered, and when it is, chance usually directs the unwary pedestrian's steps down into it. The entrance resembles to a remarkable degree the subway kiosks leading into stations along the city's underground transportation routes. So it is that occasionally an unthinking passer-by rushes down the steps in characteristic New York haste to catch a train. The illusion invariably persists until he has descended two flights and made a sudden turn to the left.

The visitor hears a low hum of motors coming from a pit in the center of the vast room and sees walls of vitreous glazed tile, white with occasional borders and inserts of Greek blue. The place is kept very clean and the air remarkably sweet. There is nothing to suggest to the casual eye the intent of this efficient and necessary activity.



ONE OF THE THREE INCLINED BAND SCREENS IN THE CANAL STREET PLANT

Two distinct departments are located in this subterranean room—a 30 x 60-foot pump chamber, and a 70 x 70-foot screen chamber. It is in the latter that operations begin. A swing-gate controls the flow of sewage from a 4½-foot influent channel which receives the flow of all sewers in the 382 acres from Canal



SLUDGE TANK AND EJECTOR

to 14th Street and from Broadway to the Hudson. When the gate is opened, the sewage flows to three inclined Rex band conveyor screens that travel from the front to the back of the chamber. These screens are constructed of finely perforated manganese bronze plate, which intercepts the grosser solid matter and allows only the clarified liquid to flow on. The sludge clinging to the screen is then carried to the top of the chamber, where a series of brushes sweeps it into hoppers directly beneath. The screens move at the rate of 10 feet a minute, and each has a capacity of 12,000,000 gallons of sewage every 24 hours.

From the hoppers the sludge goes to the storage tank, where it remains until trucks, at a small loading building on the street above, are ready to receive it. A pneumatic ejector under the storage tank then blows the screenings through a 6-inch exhaust pipe leading directly into the vehicles. The loads are finally taken out to sea on scows and dumped.

In the meantime the screened sewage enters an effluent channel which diverts it into a large wet well. From here, as it reaches predetermined heights, it is pumped through discharge pipes into a new high-level sewer connecting to the Hudson River. While passing through the discharge pipe, the screened sewage may be first treated with liquid chloride. Six vacuum-type W & T chlorinators, synchronized with the discharge pipes by means of solenoid valves, constitute the equipment for this part of the treatment, which greatly reduces bacterial pollution.

Two 24-inch and one 18-inch centrifugal pump in the station are driven by two 150-horse-power and one 100-horse-power motor. There is also a 50-horse-power motor which operates the air-compressor for the pneumatic ejectors. These are installed in the pump chamber, the second main division of the plant. Other motors of 3 and 7½ horse-power each for moving the screens, and one 5-horse-power motor for running the ventilating system, are located on a balcony above the screening chamber. To heat the plant, prevent dampness, and supply the large amount of hot water needed to clean the screens, there is an automatic gas-fired boiler, this type of fuel eliminating ash removal.

Although in commission only since April, 1925, the sewage treatment plant is already surpassing the results expected of it. The designing engineers are studying it closely and if, after a generous probationary period, it continues to prove consistently useful, others like it will be constructed. With enough of these screening stations, it is thought that the pollution of the waters of the Hudson may be materially reduced, at least as far as visible pollution is concerned.

ACKNOWLEDGMENT.—By courtesy of *The Edison Monthly*. Photographs by Standard Photographic Service.

CHLORINATING EQUIPMENT IN CANAL STREET SCREENING STATION, NEW YORK

Constructive versus Destructive Economy

By Arthur E. Nelson
Mayor, St. Paul, Minn.

TAX reduction and economy in government are the order of the day. Candidates for Federal, state, city and county offices vie with each other in expounding the virtues of better government at a decreased cost. In these discussions there is too little attempt to distinguish between constructive and destructive economy. There are those in and out of public office who demand a reduction in taxes without regard to the welfare of the public. This I believe to be destructive economy. There are others who dare to advocate public improvements and at times increases in the cost of operating governments, in order to promote the general welfare of the public, at the same time demanding that economy is virtue to be practiced always. The latter I would call constructive economy.

True economy in government does not consist in the stoppage of needed public improvements. True, the taxes in municipalities throughout the country are high; they have been growing. In some instances they are too high, because of the wasteful practices of those in public office. In many instances, however, public officials and taxpayers are stopping public improvements at times when such improvements are most necessary.

Municipalities have grown tremendously during the past few years. When a virgin prairie is converted into a municipality, the people in that community must contribute in taxes for certain public necessities, without which a city as such could not exist. Uninhabited prairie land needs no schools, no sewers, no paved highways, no police and fire protection, no supervision of health, no planning, no zoning, no parks, no playgrounds, no permanent water-supply, no lights, no building restrictions, no government. When that prairie is converted into a municipality, all these things are necessary and they must be paid for. Many citizens, however, will demand that a halt be called upon improvements when times are not good, and such citizens will not distinguish between necessary and unnecessary improvements. The cry will go out against the expenditure of funds even for facilities within municipalities that are necessary for the proper protection of the health, the safety, and the education of the people.

When improvements are necessary, they should not be delayed because of the fact that general business conditions are not good. On the contrary, all needed public improvements should be put in so far as possible at just such times. Our social and industrial structure can best be maintained when all men and women ordinarily employed in gainful occupations are permanently at work.

In my opinion, it is the duty of officials of municipalities, of the states and of the nation to aid so far as possible in providing for employment of individuals at times when there is a depression in industry. I am firmly of the opinion that when industry is progressing rapidly, resulting in the employment of all who wish to work, governments should stop or delay public improvements in so far as possible in order that such improvements may be put in at times when industry is at low ebb.

In every city in this country, unemployment is one of the greatest problems with which a municipality has to cope. Periodic unemployment is demoralizing to the social structure and imposes upon the taxpayers added burdens by reason of the necessity for maintenance of the families of those who seek work but are unable to obtain it.

The greatest difficulty encountered by offi-

Public Works as a Stabilizer of Business Prosperity

In concluding his address before the 1925 Convention of the League of Minnesota Municipalities, from which this article has been prepared, Mayor Nelson said:

"We cannot be assured of the permanence of our social and industrial structure until such time as we can devise ways and means to provide for employment for every individual who wants to work, at all times. This is not a socialistic theory; it is but a statement of fact, which we, who believe in conservative government as exemplified in America, must recognize. Failing to recognize it, we fail to see the greatest danger confronting our cherished American institutions."

cials who seek to assist in maintaining a more even balance between employment and unemployment is the attitude of mind of the public. When times are good, the public demands improvements. When times are not good, the public asks that improvements be halted. *Officials must take exactly the opposite view if they would serve best their constituents.* When men are unemployed, they cannot buy. If they do not buy, the merchant and the manufacturer must reduce the sales force and the working force. Thus the cycle continues. On the other hand, if farming and industry are not otherwise prosperous, but public improvements are going forward, the working man is employed, can buy from the merchant, who will retain his sales force and will buy from the manufacturer, who thus will continue the employment of the industrial workers.

But immediately the question will be asked: How are these improvements to be paid for? Some will suggest that the issuance of bonds for such purpose is a nefarious practice and should not be indulged in.

Bond issues by political subdivisions are entirely proper if issued for public improvements that are necessary, if the bonds are issued for a period no longer than the life of the improvement, and if they are retired when they are due. The curse of bond issues in the past has not been their issuance, but failure on the part of the officials to make provision for their retirement when due. There is hardly a municipality in the country which is not now retiring bonds for improvements that have been worn out. Such a practice is vicious; it should not be permitted.

Bond issues are just as necessary for permanent improvements within a municipality as they are for permanent improvements in a large industry. A growing municipality could not possibly provide for permanent improvements, which are necessary to promote the health, the safety, the convenience, and the general welfare of the public, out of direct taxation. To attempt to do so would be to confiscate the property of the taxpayer within the city. Yearly recurring expenditures for improvements should be paid for out of direct taxes, but large improvement programs in flourishing municipalities must be taken care of by bond issue. The principle is firmly established and is one which conservative business men will agree is proper.

Arrest of a Mayor of New York City in 1681

Photograph copyright by Ewing Galloway, New York

This picture shows the arrest of Major William Dyre, Mayor of New York in 1681, for imposing unjust taxes. He was sent to London for trial and acquitted, but never returned to the city. The house from which he was taken stood on what is now the southeast corner of Broadway and Liberty Street. The street was known as King Street, and in it is pictured the first public pump in New York.

—From *Greater New York*, Bulletin of The Merchants' Association of New York.

The Fireman's Gas Mask and Its Use

By Edward Steidle

Carnegie Institute of Technology, Pittsburgh, Pa.

EVERY fire is a battle with all its high stakes for strategy and valor. The fighting of and winning over any large blaze is as thrilling a story of generalship and soldiering as any warrior could desire. Usually the fire chief must develop his entire plan of campaign within a few minutes of his arrival on the scene. Each company is deployed as it comes up and takes the position mapped out for it, and the length of time that any company can hold its position inside a burning building or other crucial point is fairly accurately gaged. Reinforcements are called when the engagement becomes too critical to be met by the companies that answered the first alarm. A water tower is placed at a strategical point, a spotlight at another, ladders are run into position and streams of water directed where most necessary. Perhaps the rescue squad or squad wagon is called into action; and so the story goes on, often with tales of death and injury to firemen and noncombatants, to the last chapter, when the companies are ordered to "take up" one by one and the battle is finally won.

To-day officials of fire departments all over the country are constantly on the lookout for new inventions and improved apparatus that may be utilized by the men whose lives are devoted to the saving of life and property from fire and smoke. Almost every day science offers some new aid in this thrilling and indispensable work. One of these aids is the gas mask.

Following the war the United States Bureau of Mines turned its efforts towards the adaptation and development of gas masks for industrial purposes and investigation of industrial uses, and ascertained that carbon monoxide is the greatest gas hazard in industry. To date, twelve different canisters have been developed to give protection against some important gas or combination of gases, or a mixture of all industrial gases, and the Bureau has established a color scheme to indicate their special service. One canister painted red gives effective protection against carbon monoxide, as well as all other common industrial gases, including petroleum vapors and acid and ammonia fumes. This is the logical canister for use by fire departments, because a fireman is liable to encounter all kinds of industrial gases and cannot be hampered by selecting and adjusting a special canister while working under pressure. With this protection a fireman is ready to meet every emergency where respiratory protection is required, excepting dangerously vitiated air (below 16 per cent oxygen) and air containing excessive quantities of poisonous gas (more than 2 per cent). The latter concentration is not exceeded in ordinarily well-ventilated places, but higher concentrations may occur in tanks or apparatus containing very volatile liquids or where large quantities of gas are evolved.

A canister of this type makes up what the Bureau of Mines calls the "Universal gas

FIREMAN EQUIPPED WITH ALL-SERVICE GAS MASK

mask." A similar mask is made by the Chemical Warfare Service and is called the "All-Purpose gas mask." The Bureau of Mines makes a smaller canister of the same type which is called the "Fireman's gas mask." This latter mask is practically duplicated in regard to service performance, but with some variation in construction and chemicals, by the so-called "Burrell All-Service gas mask," manufactured by the Mine Safety Appliances Company of Pittsburgh, Pa.

Permissible Gas Masks

The Bureau of Mines has prepared a schedule (Schedule 14-A—"Procedure for Establishing a List of Permissible Gas Masks; Fees, Character, Tests, and Conditions Under Which Gas Masks Will Be Tested") according to which the Bureau undertakes to approve officially any commercially manufactured gas masks which meet the tests and requirements specified. These tests are very thorough and include such important considerations as color and markings, materials, design and construction, face-piece tests, resistance to flow of air, canister tests, chemical stability, and high rates of breathing and maximum concentrations. The Bureau's approval guarantees that a particular type of mask within certain limitations is entirely reliable.

The results of the investigations of the Bureau of Mines regarding these and allied problems have been published in numerous technical papers issued by that Bureau and are available free by writing to Washington, D. C., or have been published in technical journals, which are on file at any library or are available by writing for them. A list of references to the various publications and articles published to date of special interest to firemen is given at the end of this paper. Every fire department should have them on hand for ready reference and study by men during leisure hours.

Experience of Fire Departments with Gas Masks

In order to obtain the views of experienced firemen in the use of gas masks, the writer sent a questionnaire to the chief of each of 154 fire departments in this country which have purchased one or more All-Service masks. It developed that at Washington, D. C., there are 122 masks and at Philadelphia 116. Information on the following points was asked:

1. Were the firemen trained in the use of gas masks?
2. What were the conditions under which masks have been used?
3. What were the conditions prior to acquisition of masks when they could have been used to advantage in fighting fires?
4. How many men have been killed by gas and smoke inhaled while fighting fires, or died as the result of such exposure?

Replies were received from 117 fire chiefs, of whom at least 98 per cent were enthusiastic regarding the efficacy of this type of mask. The following is a summary of the experience reported:

1. In 32 cases the firemen were given various forms of training, and in 7 cases there was no training. A properly arranged smoke room was used by 5 fire departments.

2. Masks were used for the following purposes: in thick smoke, leaking ammonia systems, natural gas, illuminating gas, industrial gases, near blazing fires, holds of ships, basement fires, chloroform plants, sulphur plants, fumes of burning rubber, gasoline and oil fires, sulphur fumes, lumber fires, soft coal fires, fire in ice house, drug stores, and such. Many of the cases consisted of wearing masks while discovering the seat of a fire in houses or in basements, and in plants using ammonia systems. They were worn successfully in numerous cases of places filled with industrial gases, and frequently at fires where valves on some pipe line could not have been found without masks.

3. Prior to acquisition of masks by the fire departments it is stated that firemen were limited to the extent of their endurance or the amount of smoke they could "eat," as the saying is. The men were severely handicapped on many occasions, particularly at basement fires. Men have had to be relayed to relieve others every minute or so; handkerchiefs and sponges were worn. Considerable damage to property has resulted through firemen's being without some sort of respiratory protection. Men had to crawl on hands and knees to keep below the smoke in some cases. Of course many fires have been handled successfully without masks and are being fought easily, but they are an added advantage to a fire department and in many cases are almost indispensable.

4. As to how many firemen have been killed by gas and smoke inhaled while fighting fires, or have died as the result of such exposure, 25 replies said that none had succumbed, but from one to many had been overcome at any one fire. A dozen men at different fires were killed outright or soon after. While several replies indicated that no definite answer was possible, they did think that men who had been retired for disability probably died later from the effects of inhalation of gas and smoke. One reply was as follows from the Chief in a city of 430,000 people: "I know of no instance, since we adopted the use of gas masks, of a fireman wearing the mask having been affected by gas or smoke.

Limitations of the All-Service Gas Mask

Gas masks of the canister type are not self-contained and simply purify the air breathed through them; consequently, they should not

be used in atmosphere where there is a deficiency of oxygen—in other words, where there is les than 16 per cent of oxygen. On the other hand, the canister has been given a rated life with a ncessary safety factor, and they must not be used longer than the periods specified, which in the case of the All-Service mask is two hours.

An open light, such as a candle or lantern (not carbide lamp), is extinguished in air containing less than 16 per cent of oxygen. In a basement fire or other smoldering fires below ground, the atmosphere should be tested with an open light before the firemen enter the area wearing gas masks. If the light burns, there need be no fear in wearing the mask. In connection with petroleum fires, gasoline tanks, natural gas lines, etc., the only reliable means of testing such an atmosphere for oxygen is with the use of the so-called "flame safety lamp," which will not ignite any flammable gas which may be present. It is pointed out, however, that a flame safety lamp is not absolute proof against hydrogen gas which may be in a manhole on account of electrolysis, and is also a principal constituent of water gas, and therefore this type of lamp should not be used indiscriminately where hydrogen gas may be present. Explosive mixtures of hydrogen and air may be quickly tested by means of a gas bomb designed by S. H. Katz, of the Bureau of Mines. Probably the best rescue equipment to use in atmospheres likely to contain hydrogen are hose masks or self-contained oxygen breathing apparatus and permissible electric lamps.

The canister will give two hours' protection against carbon monoxide, but the canister will deteriorate in regard to carbon monoxide protection when worn in air, whether this gas is present or not. In the case of all other gases, the canister does not deteriorate unless a specific gas is present in the air.

Mention might be made here of the use of the life-line in fire-fighting work. It consists of a properly designed hand reel and about 200 feet of light, strong rope. In the case of a highly congested smoky storehouse basement fire, for example, where preliminary exploration is being made with the use of masks, a life-line should be dragged along, which will prevent the exploring party from becoming lost. A chemical or other hose will serve the same purpose if it is taken into the area. Care must be taken by the leader so that he does not step into a pit or elevator shaft, and a standardized set of pull signals on the life-lines should be used.

Training in the Use of Gas Masks

The fireman's gas mask cannot be psychologically right without confidence. Confidence can only be attained by study and thorough training in the use of the mask in irrespirable smokes and gases. Only 7 of the 154 fire departments using All-Service gas masks actually trained in smoke; the training consisted in merely adjusting the mask in fresh air. Each fire company should provide a small, gas-tight smoke room in the station for training purposes; or possibly a centralized training station would be more practical and would give better service. Each person who trains in the use of gas masks should undergo a physical examination, especially as to the condition of the lungs and heart.

The training should consist of manual labor in irrespirable smoke and gases for a period of two hours, and the work should consist of the common tasks required of firemen during fires. With regard to a properly designed training quarters and systematized exercises, reference should be made to the Bureau of Mines handbook entitled, "Self-contained Mine Rescue Oxygen-Breathing Apparatus." Every member of a fire department should train in the use of gas masks, so as to recognize their special advantages as well as their limitations. Each new recruit should be required to study and train in the use of the mask with the same thoroughness that he does other fire-fighting apparatus. This should be done in connection with the "training course," providing a fireman's school is maintained. As in mine-rescue work, each fire company usually has what might be called supermen, or in this connection men who are more likely to have more knowledge and confidence in the mask. These men should be used as gas mask men and should train in the use of the mask as outlined above at least one period every three months, and preferably every month.

It might be added that all firemen should be trained in methods of first aid to the injured, including artificial respiration and the use of approved appliances to be used in connection with artificial respiration. The Safety Service Division of the Bureau of Mines, which gives first-aid and mine-rescue training to miners, has from time to time given training to fire departments in various parts of the country on request to the Director, Bureau of Mines, Washington, D. C. A manual of first aid is also available free.

The Rescue Squad

In the last few years picked squads of firemen have been assigned to man special scientific equipment and assist the regular engine and hook-and-ladder companies. Perhaps the first rescue squad attached to a fire department in America was organized in Detroit in 1908. The equipment of this squad was limited to a life-net, but it actually blazed the trail for the highly specialized work now being carried on in most large cities and many small ones. Smoke helmets were used by San Francisco and Chicago firemen in 1909, but it remained for the New York fire department to equip the first rescue squad with self-contained oxygen-breathing apparatus and equip a squad truck with a variety of special scientific and mechanical apparatus that was useful, not only in fire rescue work, but in almost any emergency when life was in peril. A squad truck should be equipped with at least six All-Service gas masks and six extra canisters; two complete sets of self-contained oxygen-breathing apparatus of an approved, half-hour type, suitable hose mask, one permissible flame safety lamp, and two permissible electric mine lamps, and one H-H (Henderson-Haggard) Inhalator. Obviously, each member of the squad should be thoroughly trained in the use of this fire-rescue equipment.

Acknowledgments

ACKNOWLEDGMENTS.—The foregoing article comprises excerpts from a paper read by Mr. Steidle before the recent annual convention of The International Association of Fire Engineers, at Louisville, Ky. In the paper the author expresses his indebtedness to Frank C. Loxterman, Deputy Fire Chief, Pittsburgh Fire Department, and to Sidney H. Katz and M. W. Bernewitz, of the Bureau of Mines, who reviewed and criticised the manuscript, and especially to the fire chiefs who sent in answers to questionnaires.

REFERENCE TO BUREAU OF MINES PUBLICATIONS

Technical Paper 248.—Gas Masks for Gases Met in Fighting Fires, by Arno C. Fieldner, Sidney H. Katz, and Selwyne P. Kenny, with a chapter on The Effects of Gases on Men and The Treatment of Various Forms of Gas Poisoning, by Yandell Henderson.

Technical Paper 300.—The Universal and the Fireman's Gas Masks, by S. H. Katz, J. J. Bloomfield, and A. C. Fieldner.

Schedule 14-A.—Procedure for Establishing a List of Permissible Gas Masks; Fees, Character of Tests, and Conditions Under Which Gas Masks Will Be Tested.

Bulletin 14.—Use of Carbon Monoxide Gas Masks in Mines, by S. H. Katz, G. S. McCaa, and A. L. Barth. (Carnegie Institute of Technology, Bureau of Mines, and Advisory Board of Coal Mine Operators and Engineers).

Technical Paper 348.—Gas Masks for Gasoline and Petroleum Vapors, by S. H. Katz and J. J. Bloomfield.

Hand Book.—Self-contained Mine Rescue Oxygen-Breathing Apparatus, by D. J. Parker, G. S. McCaa, and E. H. Denny.

Hand Book.—Advanced First Aid Instructions.

Report of Investigations.—Gas Hazards in Street Manholes, by S. H. Katz, J. J. Bloomfield, and E. G. Weiter.

Physical Standards for Policemen and Fire Fighters

AT the recent annual convention of the National Association of Police and Fire Surgeons and Medical Directors of Civil Service Commissions, held in Grand Rapids, the principal subject discussed was the medical and physical requirements for policemen and fire fighters. A subcommittee of the Association had been studying the matter since the convention last year and, through Dr. Joseph A. Kene of the New York City Civil Service Commission, presented its report. The report as quoted in part in *Public Personnel Studies* in the issue of November, 1925, is as follows:

"The standards recommended are: Minimum age, 21 years; maximum age, 29 years; general appearance free from marked deformity and all parasitic or systemic skin diseases and from evidence of intemperance with stimulants or drugs. Body must be well proportioned, good muscular development, and personal cleanliness; no obesity, muscular weakness, or poor physique; nose, mouth, and teeth unobstructed and free of deformities or conditions that interfere with distinct speech, or that predispose to disease of ear, nose, or throat; teeth must be clean, cared for, and free of multiple cavities; must have at least two molars to each jaw on each side and in good apposition for proper mastication; jaws free from badly broken or decayed teeth that make filling or crowning impossible; missing teeth must be supplied by crown or bridge work, or rubber dentures will be acceptable; at least 20 natural teeth must be present; reject applicant for rupture in any form; genetalia must be free from deformities, varicocele hydrocele, enlargement, and so forth; varicose veins or a marked tendency to their formation must be rejected; arms, legs, hands, and feet free from affections of joints, sprains, stiffness, or other conditions, such as flat-foot, ingrowing nails, hammer toes, and so forth.

"Height and weight within these limits: For fireman a minimum height of 5 feet 6 inches, 140 pounds in weight, 34½-inch chest normal with 3½-inch expansion; for policeman the minimum should be 5 feet 7½ inches in height, 140 pounds, with a chest of 33½, to be expanded 3 inches. If a fireman measures 6 feet 5 inches he should not weigh less than 185, with a 40-inch chest, to be expanded 4½ inches. Likewise for policemen who might be that big.

"Candidate should be able to read with each eye separately standard test types at 20 feet and be free from color blindness, chronic inflammation of the lids, and permanent abnormalities, hearing in each ear required; respiration must be full, easy, and regular; circulation of heart must be uniform, free, and steady, its rhythm regular, and heart free from organic changes; kidneys must be healthy, blood pressure not over 150, and those successfully passing medical, physical, and mental examinations should be subjected to the Wassermann test before appointment."

Wisconsin Fights It Out for Best City

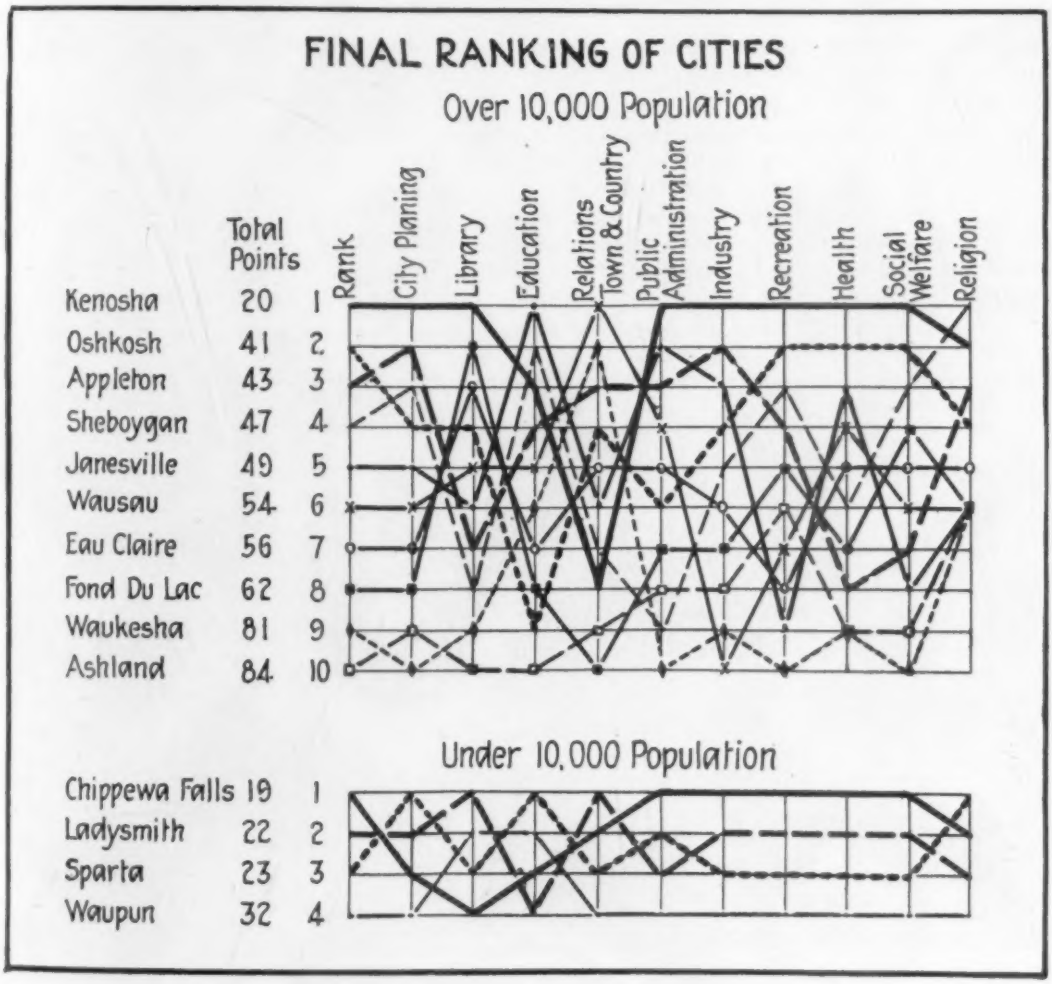
By Aubrey W. Williams

Executive Secretary, Wisconsin Conference of Social Work, Madison, Wis.

THE cities in Wisconsin scored uniformly high in Education, Library Work, Industry, and City Planning; medium in Town and Country Relations, Recreation, and Religion; and poor in Public Administration, Social Work, and Health, in a recent Statewide Best City Contest conducted by the Wisconsin Conference of Social Work in cooperation with the University of Wisconsin Extension Division.

The cities were grouped into two classes; those above 10,000 and not over 60,000 population, and those under 10,000 population. In the upper bracket Kenosha won over nine other contesting cities, with Oshkosh second, Appleton third, Sheboygan fourth, and Janesville fifth. To the winner of this group a prize of $1,000 was awarded. Chippewa Falls won the $500 prize in the lower bracket, with Ladysmith second.

The scoring of the cities was based on measurement standards worked out under the direction of the Wisconsin Conference of Social Work, in cooperation with the University of Wisconsin Extension Division, Departments of Sociology, Education, and College of Agriculture of the University of Wisconsin, Department of Public Instruction, State Industrial Commission, Bureau of Vocational Education, Library Commission, Board of Health, of Wisconsin, and other authorities throughout the nation.



THE COUNTY COURT HOUSE SHOWN AT THE LEFT IS THE FIRST BUILDING OF KENOSHA'S CIVIC CENTER TO BE COMPLETED

This building was erected at a cost of $1,000,000 and was opened in August, 1925

Citizens made the inventory of their respective communities, first gathering the facts requested in the scoring schedules, then tabulating them in reports for the judges. One hundred fifty-six volumes of facts were submitted to the judges for their perusal.

Ten judges were selected, one from each of the ten divisions of the measurement standards, to make the award. With the exception of two, these judges were from outside of Wisconsin. The list follows:

City Planning—Myron D. Downs, City Planner, of Toledo, Ohio.

Public Administration—Dr. Luther H. Gulick, Director, National Institute of Public Administration, New York.

Health—Dr. S. J. Crumbine, Director of Public Relations, American Child Health Association, New York.

Education—Dr. W. S. Deffenbaugh, U. S. Department of Education, Washington, D. C.

Social Welfare—Dr. C. C. Carstens, Executive Director, Child Welfare League of America.

Recreation—J. R. Batchelor, Playground and Recreation Association of America.

Town and Rural Relations—Dr. Nat T. Frame, University of West Virginia.

Library—Joseph L. Wheeler, Librarian, Public Library, Youngstown, Ohio.

Industry—Stewart Scrimshaw, Director of Industrial

LAGOON IN LINCOLN PARK, KENOSHA, WIS.

Relations, Kearney & Kearney.
Religion—Several prominent ministers.

The judges, after analyzing the scoring reports of the cities for their respective fields, made a visit to the communities for first-hand impressions. A significant fact came out just here. The citizen, ordinarily incapacitated to tell the facts of his town by an over-zealous desire to boost its fortunes, had stuck very closely to the facts. There was little or no disparity between the facts given as such in the reports and the conditions found.

The contest element was only a vehicle—but it did work. On the night the awards were made every one of the contesting cities had a delegation present. It is obvious that the contest accomplished its purpose, which, as stated by Professor E. B. Gordon, who suggested the project, was "to stimulate pride in those aspects of community life which have to do with child welfare, family life, and community well-being, and promote activities among the cities in the state in improving the conditions of morals, health, recreation, education, and various other projects related to the human side of individual and community life."

There is a demand for a similar scoring three years hence of these and other cities that feel confident of a high place in the sun, all of which indicates that with few exceptions the contesting cities agree to the rank allotted them, but want another chance to try for several rungs higher up the ladder.

NOTE.—The Measurement Standards which were used in the Wisconsin Better Cities Contest have been bound together in a booklet, and can be had for $1 per copy. Write Aubrey W. Williams, Executive Secretary, Wisconsin Conference of Social Work, University Extension Building, Madison, Wis.

Employees of Municipal Utilities Subject to Federal Income Tax

SALARIES and wages received by officers and employees of municipally owned and operated water, lighting, and street railway systems are subject to the income tax under the revenue acts of 1918, 1921, and 1924, according to rulings of the Bureau of Internal Revenue, supported by various court decisions.

In reply to an inquiry from the Editor of THE AMERICAN CITY, the following statement of the Bureau's position with reference to such rulings has been received from the Treasury Department under date of December 3, 1925:

"The Bureau has carefully considered the income tax status of the compensation of officers and employees of municipally owned and operated water, lighting, and street railway systems, as well as other activities of a non-governmental character. The rulings of the Bureau accept the distinction between essential governmental functions of a state or a municipality on the one hand and its proprietary or private activities on the other as determining the question of the taxability of the compensation received by officers and employees of the state or municipality, and hold that the implied exemption from Federal taxation applies to the compensation of officers and employees engaged in the former activities, and does not apply to the compensation of officers and employees engaged in the latter activities. A municipality in furnishing water, light, power, or street-railway transportation for the general use of its residents is considered to be acting in a proprietary rather than in its sovereign capacity. The compensation of the officers and employees of a municipality engaged in such activities is not exempt from income tax under the Revenue Acts of 1918, 1921, and 1924."

State Parks Are Gaining Ground

STATE parks are rapidly coming to have their rightful place as one of the major recreational resources of this country. Between the easily accessible, but often formal, city parks and the remote and splendidly wild national preserves comes the state park, preserving the best scenic and recreational features of every commonwealth, which may be readily reached by the people of the various states and may attract tourists from other parts of the country.

State park development began about thirty years ago with the creation of the Adirondack Park in New York and with the smaller areas in a few other northern states. The value of state parks in the development of the recreational resources of the United States was slightly appreciated at first, but understanding of their place slowly grew until it was given impetus by the creation of the Palisades Interstate Park in New York, through a combination of philanthropy by private citizens and enlightened support by public officials.

State park statistics shown by the survey of state park developments:

Thirty-three states have state parks and state forests.

Eight states are now studying programs for state parks or forests to have recreational use.

New York State leads with 62 tracts of from 1 to 1,700,000 acres (Adirondack Park). Michigan is second, with 53 parks, totaling 750,000 acres. Texas is third, with 51 parks, totaling 30,000 acres, all acquired by gift.

Among the notable new projects in 1925 disclosed by the survey are the acquisition of the Lake Michigan Dunes, 45 miles east of Chicago, by Indiana for one of its state parks, a recreational area which will be for Chicago what the Palisades Interstate Park is for New York.

—From a paper by Raymond H. Torrey, Field Secretary, National Conference on State Parks, presented at the recent annual convention of the Playground and Recreation Association of America.

Creating a Setting for a Power-Plant

Francis Asbury Robinson
Member, American Society of Landscape Architects

MAN is known by the company he keeps, but better yet by the way he keeps his yard. A weed patch instead of a garden, a desert instead of a lawn, is often more indicative of the owner's brand of citizenship than his vote.

Manufacturers, public service corporations, mine operators and others are realizing more and more that attractive and well-kept property not only indicates a desire to serve the community, but creates a better morale among employees and pays direct dividends in good citizenship. The Iowa Power and Light Company is indicating in a splendid way its desire to set an example in civic responsibility, by the manner in which the grounds surrounding its new power-plant in Des Moines are being treated.

The power-station is located at the south end of a 63-acre tract bordering the Des Moines River and 100 feet from its shore—close enough to allow a short run to the condensers and yet far enough to permit the handling of service to the south side of the building by road and spur track. Ample room is left for expansion of the building and the trackage which will serve it to the north.

In order to avoid the danger of flood, the floor line of the building was located 3 feet above the highest known stage of the river, which brought it 8 feet above the level of the existing ground. To raise the surrounding ground to a level which would permit easy access to the building and still present an attractive appearance, involved a rather serious problem in grading. An area of several acres lying between the plant and the main road would have to be brought to this higher grade in some manner.

At this point landscape architects were retained to study and present a solution of this problem. After various schemes had been considered, a plan was adopted which has the merit of making this area an attractive setting for the building while at the same time eliminating the cost of an expensive and unattractive cinder or gravel fill.

An irregularly shaped pit several acres in extent is being created by filling around its edges. The pit is puddled with gumbo taken from the property and a water line run over from the power-station to the north end of the pit, with an overflow at the south end connected with an existing sewer which empties into the river. When this pit is filled, its shores planted with cattails, arrowhead, marsh marigold, and similar waterside plants, and its surface dotted with water-lilies, it will appear to be a natural lagoon, in which the towering power-station will be reflected beautifully as it is approached from the highway to the north. The first steel towers from the substation carrying the 33,000-volt power transmission line stand on a point around which the lagoon makes a peninsula not at all unattractive in the landscape. The next towers to the north pass out of the picture, supporting the line on its way to the city.

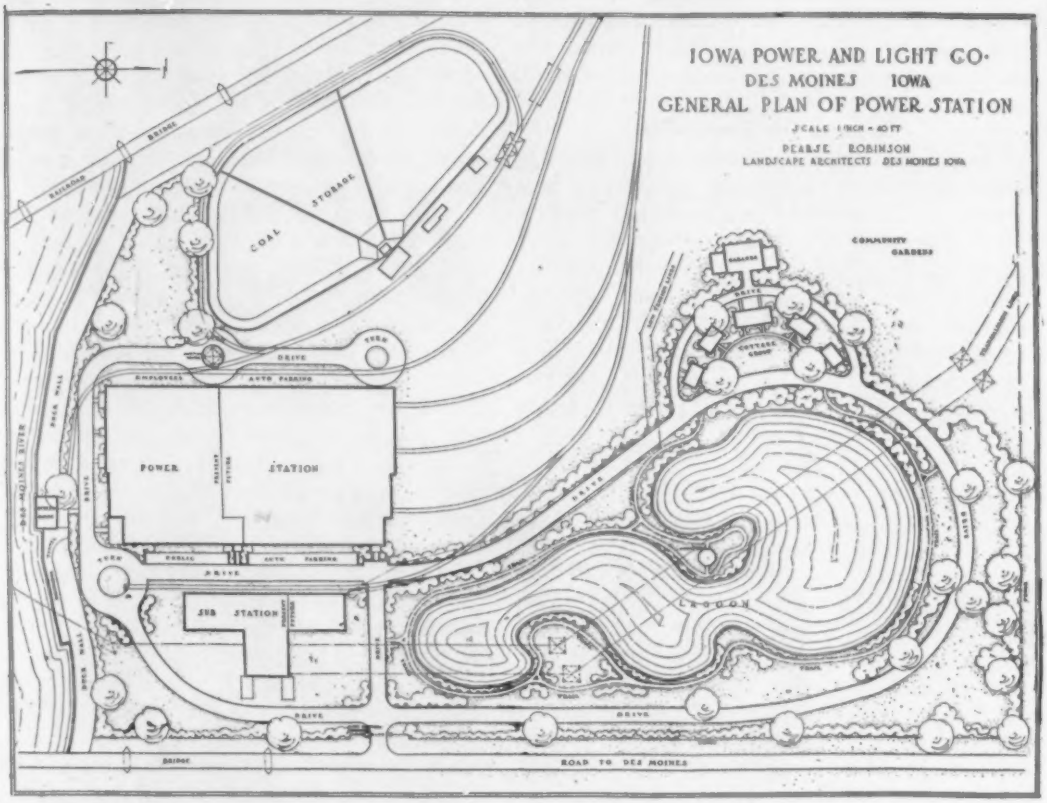
The fill to create the lagoon is being secured by pumping gravel from the river, which serves at the same time to deepen the channel in front of the screen-house and back of the dam. Upon this fill there is planned a road system which will give access to the property. From the entrance at the highway where an attrac-

Attractive Surroundings at Small Cost

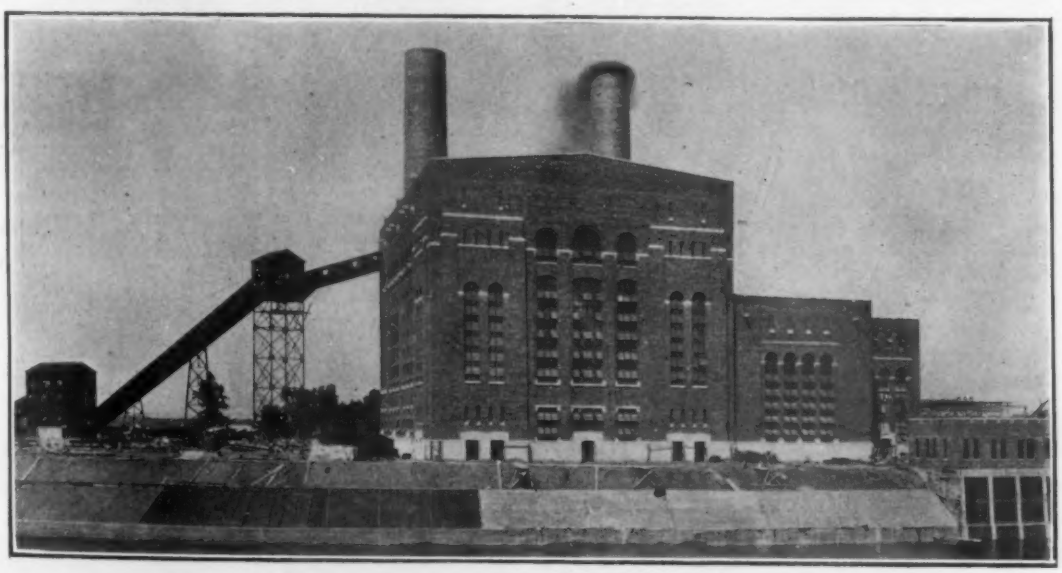
In a recent letter to The American City, C. A. Wait, Assistant to the President of the Illinois Power and Light Corporation, says:

"The Des Moines power-plant as it now stands represents an investment of three and a half to four millions. When completed to the full size contemplated, that investment will probably reach between six and seven millions.

"The actual cost—or rather, additional cost—for making the surroundings of the plant a source of pride to Des Moines and Central Iowa, above actual necessary grading to make the surroundings simply the standard surroundings of most power-plants, will not exceed $15,000. When counted against the total investment, this is so very small that it is trifling when compared—as we believe—to the actual gain in appearance, its value to the property, and its appeal to the civic pride of Des Moines."



tive brick and stone gate lodge stands guard, the road runs straight to the north pier of the extended building. Here it divides, going south to reach the public entrance at the southeast corner of the station and passing along the south and west sides for service. To the north the road winds pleasantly in easy curves around the lagoon and returns to the entrance, making a public pleasure drive which affords glimpses of the water surface through the planting which borders the shores. Another road turning directly south at the entrance gives the public direct access to the main entrance of the plant, where a large turn



NEW POWER-PLANT AT DES MOINES, IOWA

provides opportunity for returning without using the service drive to the south and west of the building. Ample automobile parking is provided for those who wish to visit the plant.

Cottages for Employees

As certain employees must be on the property continuously, a housing problem is presented which seems to be solved satisfactorily by the location of a cottage group just west of the lagoon drive. The cottages are arranged around a semicircular lawn with a service road passing behind them to the community garages. On the existing ground just to the west of this group is excellent land for community gardens, with soil 4 feet in depth over a substratum of gravel.

The gravel fill pumped from the river is kept one foot below the finished grade over the entire area, to permit of a top dressing of gumbo to retain surface moisture and of black soil to make a seed bed for the lawn and for the growing of shrubs and trees. Both gumbo and topsoil are on the property, making the operation comparatively inexpensive.

The principal problem in planting is to place trees where they will not interfere with power transmission lines and will still provide ample shade and create vistas through which the building may be seen to advantage. Another problem is the screening of the trackage and coal storage pit from public view on the highway without in any way cramping their use or spoiling the setting of the building. This result is achieved by plantings of varying heights and texture along the west lagoon drive, giving the appearance of a natural woodland thicket interspersed with trees to break the monotony of an even sky-line.

In the selection of shrubs and trees the Iowa flora have been used as a basis, so that the final effect will be that the plant has been located beside a lagoon with a site carved out of a native woodland. Sycamore, hackberry, linden, and elm trees and such shrubs as the dogwood, hawthorne, crab-apple, wild roses, sheepberry, buttonbush, elder, and sumach, are used for this purpose. The greatest success in the result will be the approximation of the setting to natural conditions, where man's handiwork has apparently had no part. Only the mellowing of time will give the verdict.

Such results the Iowa Power and Light Company are attempting to achieve. It is a great step forward from the popular conception of the barren cindered yards that have been so generally found around power-plants. An addition such as this to the esthetic development of any city is a real contribution to civic improvement, and there is no community which will not respond enthusiastically to such an evidence of good citizenship.

The Rhythm of the Buildings Makes the City

IT is not through the application of the same particular style, the same materials, the same colors and the same proportions that we create harmony. It is, rather, through good rhythm in quantities, forms, and colors. When the individual building voluntarily subordinates itself to the whole—and yet does not surrender its own individuality—we gain a consummate, wholesome work of art. To illustrate: A tree in the forest, that is unlike its neighbors in form and dimensions, nevertheless fits in harmoniously with the whole picture. . . . .

We have deceived ourselves into thinking that each individual building is wholly a problem by itself. We have been striving to build "beautiful buildings." We have believed that we could build beautiful cities with beautiful buildings, as we probably thought that we could—to use a radical illustration—build a nice square or street if we gathered fifty of the most beautiful art-buildings and brought them together. The result would be the opposite: one building would kill the others and we would spoil the harmony—and therewith the beauty, also.

Those buildings belong each to another setting with its own surroundings. They could not be torn out of that setting and transplanted without losing their charm. Their beauty depends not only on their proportions and style, but on the frame they were originally set in, as the beauty of a color does not depend on the color alone but also on its combination with other colors.

—From an article on "Architecture and City Planning," by Eliel Saarinen, Architect, of Helsingfors, Finland, in *City Planning*, October, 1925.

Fire Hazards from Domestic Oil Burners

IN a paper on oil burner fires read before the recent annual Convention of the International Association of Fire Engineers, it was pointed out by H. E. Newell, Engineer of the National Board of Fire Underwriters, that statistics clearly indicate faulty installation to be the principal fire cause. Without suitable ordinances containing the essential installation requirements which bear on fire protection and prevention, fire department officials and others charged with this supervision are seriously handicapped. It was therefore urged by Mr. Newell that municipalities adopt such ordinances. The essential provisions are included in the National Board's regulations for the construction and use of oil burning equipments for domestic use and for the storage and use of oil fuels used therewith. The Board may be addressed at 76 William Street, New York.

A Score System for Grading Water-Supplies According to Sanitary Conditions

By E. Sherman Chase

Sanitary Engineer, Metcalf & Eddy, Boston, Mass.

WATER-SUPPLY scores based upon bacterial standards alone, valuable though they may be. do not take into account all the factors which tend to make up the sanitary condition of water-supplies. Analytical results are largely history, but also serve as a basis for predictions as to future quality of a supply. Such results also show the effectiveness of sanitary safeguards and of purification methods. They may not, however, afford any clue as to potential hazards surrounding the sources of supply or the methods employed in its purification and distribution. For this purpose the physical features connected with the sources and development of the supply must be known.

The score system presented in this paper is in the main a modification of the system used in the New York State Health Department as developed by the author and Theodore Horton, formerly Chief Engineer of that Department. The system herewith presented modifies and expands the original system in several respects.

Classification of Water-Supplies

For purposes of the score system, water-supplies are divided into two main classes—surface supplies, and ground-water supplies. The surface supply group contains a special sub-group consisting of supplies taken from the Great Lakes system and from the Mississippi and St. Lawrence Rivers. The ground-water supply group also contains a sub-group consisting of supplies taken from wells over 500 feet deep.

Scoring-Factors

In dealing with water-supplies from the sanitary standpoint, there are three major factors to be considered: first, the pollution hazards; second, the protective measures; and, third, the quality condition.

The first factor, pollution hazards, is made up of those conditions active or potential which bring about or tend to bring about pollution of the water-supply, such as resident population on the watershed, or the direct discharge of sewage into sources of supply. The second factor, protective measures, consists of those barriers, either natural or artificial, which prevent or tend to prevent pollution in the original source of supply reaching the consumer. Natural storage and filtration are examples of protective measures. The third factor, quality condition, is determined by the results of analyses and by those physical attributes perceptible to the senses. Of these, bacterial content and taste and odor are examples.

Score System

In view of the simplicity resulting from the use of a percentage scale, the score system presented in this paper is based on a range of values from 0 to 100; the higher the score, the better the sanitary condition of the supply.

Scoring-Systems Possible and Helpful

The water-works engineer has generally hesitated to rate the sanitary condition of water-supplies according to any definite quantitative scale, on account of the complicated factors and many uncertainties which enter into the problem. This paper is an attempt to present a system of scoring for the sanitary condition of water-supplies which will serve as a means for expressing this condition in quantitative terms. It must be pointed out that such terms are of necessity relative only and cannot be absolute. Primarily, any score system must be used largely as an aid to judgment.

Precedents for scoring rather intangible qualities are fairly numerous. Health departments establish scores for dairies and for the quality of milk-supplies. In the field of water-supply quality the Health Department of New York State has used a score system for several years. Bacterial index standards have been established by the U. S. Treasury Department for water-supplies used on interstate carriers. The Board of Fire Underwriters has a system for scoring the fire hazards of any municipality and incidentally scores the adequacy of the water-works system from the standpoint of fire protection.

The 100 scale is divided into three parts, of 50, 20, and 30, which are assigned to the factors for pollution hazards, protective measures, and quality condition, respectively. These values are assigned when the factor under consideration represents perfect or nearly perfect conditions. The higher value assigned the first factor is justified by the distinct advantage of supplies from unpolluted sources over those requiring purification. Protective measures are assigned a lower value than quality condition, because the existence of such measures is no assurance of continuously effective purification, whereas, analytical results, if of sufficient scope, measure the final end point, the quality of the supply furnished. In other words, the proof of the water is in the drinking. It should be noted that the sum of perfect scores for the first and third factors alone does not equal 100. This is due to the fact that under conditions as they exist no supply, in the absence of barriers against chance pollution, can be considered perfect. A supply taken directly from a pure mountain stream may be polluted by hunters or other visitors to an otherwise uninhabited watershed, and analytical results may fail to show the presence of such intermittent and potentially dangerous contamination.

Outline of Score System

The number and diversity of minor factors affecting the sanitary condition of water-supplies render it impossible to discuss at length each of these minor factors in a brief paper. Consequently, the following outline has been prepared, to summarize the factors involved, together with tentative score values for each factor.

SURFACE SUPPLIES

MAIN GROUP

	Score
I. Pollution Hazards	
Score for no hazard	50
Hazards connected with sources of supply	
1. Population on watershed (p = population per square mile of watershed)	
a. Contributing indirect pollution	$-2\sqrt{p}$
b. Contributing direct pollution (sewage)	$-8\sqrt{p}$
c. Where sewage is diverted from watershed, consider population decreased by one-half the population whose sewage is thus diverted	
2. Highways and railroads (per linear mile per square mile of water shed)	—1
3. Lumbering, labor camps, hunting, etc.	
a. Lumbering, labor camps, etc.	—2
b. Hunting, picnicking, etc.	—1
4. Animal pollution	
a. Direct	—4
b. Indirect	—2
5. Industrial wastes	—5
6. Leaky intake, suction pipe or gravity main passing through sewage-polluted water	—25
Hazards connected with storage and distribution of supply	
7. Fishing, boating, ice-cutting, bathing, etc., on reservoirs	
a. Fishing and boating	—2
b. Ice-cutting	
Ice cutting at reservoir	—2
Ice house away from reservoir	—1
c. Bathing	—5
8. Accessible distribution reservoirs	
a. Open and unprotected	—5
b. Open but protected by locked fence, etc.	—2
9. Inadequate protection against polluted water leaking into pure water reservoirs, e. g., double storage tanks, one part for safe and other for unsafe water; leaky raw-water conduits passing through clear-water basins, etc.	—5
10. Cross-connections with polluted supplies	—10
11. Dual water-supply systems, one from a safe source and the other for emergency use from a sewage-polluted source	—10
II. Protective Measures	
Total score not to exceed	20
1. Sewage and industrial wastes treatment, divide score for direct pollution hazard, population and industrial wastes hazard, according to extent of treatment, as follows:	
a. Sedimentation, divide by 2	
b. Complete treatment without disinfection, divide by 3	
c. Complete treatment with disinfection, divide by 4	
2. Proper sanitary regulation, patrol and enforcement	4
3. Ownership of watershed, 100%—for less than 100% prorate, according to area owned	5
4. Storage (minimum)	
a. One month or more	10
b. Two weeks	5
5. Water purification	
a. Chlorination	10
b. Pressure mechanical filters	
With coagulation basin	10
Without coagulation basin	5
c. Gravity mechanical filters	15
d. Slow sand filters	15
e. Copper sulphate treatment, aeration, etc., for algæ	5
For combinations of the above purification methods, add individual scores, total credited not to exceed 20.	
6. Covered distributing reservoirs	10
Fenced distributing reservoirs	5
7. Adequate pressure and storage (rendering emergency or auxiliary supplies unnecessary)	10
Penalties for failure or inadequacy of protective measures	
1. Improper operation of sewage and industrial wastes treatment plants, allow no credit	
2. Lax enforcement of sanitary regulations, improper or inadequate regulations, no, or irregular, patrol	—2 to —4
3. Short circuits in storage reservoir	—5
4. Improper operation of purification plants not to exceed —15)	
a. Inadequate dosage of chlorine	—10
b. Intermittent operation of chlorination apparatus, absence of duplicate equipment, etc.	—5
c. No coagulant with mechanical filters	—10
d. Exhaustion of chemicals or chemicals of poor quality	—5
e. Filters in poor condition	—5
f. Combustible buildings housing essential equipment	—5
III. Quality Condition	
Total score not to exceed	30
Turbidity	
Clear	2
0 to 5 p.p.m	1

Over 5 p.p.m.	0
Color	
Colorless	2
0 to 10 p.p.m.	1
Over 10 p.p.m.	0
Odor	
None	2
Taste	
None	2
Hardness	
Under 50 p.p.m.	1
Corrosiveness	
None	1
Iron and manganese	
Less than 0.5 p.p.m.	1
Total bacterial counts on agar at 37° C.—24 hrs.	
Less than 100 per c.c.	5
Over 100 per c. c.	0
B. coli type	0
Absent in 100% of 10 c. c inoculations	20
Present in part of 10 c. c inoculations, prorate according to per cent of samples positive	

SURFACE SUPPLIES

SUB-GROUP—GREAT LAKES, MISSISSIPPI AND ST. LAWRENCE RIVERS

I. Pollution Hazards	
Score for no hazard	50
Population within two weeks' time of flow above intake in case of rivers or within 30 miles of intake in case of Great Lakes ($p = \frac{\text{Population}}{1{,}000}$)	
a. Contributing indirect pollution	$-2\sqrt{p}$
b. Contributing direct pollution	$-8\sqrt{p}$
Other pollution hazards score, where applicable, the same as for main group	
II. Protective Measures	
Same as for main group	
III. Quality Condition	
Same as for main group	

GROUND-WATER SUPPLIES

MAIN GROUP (DEPTH LESS THAN 500 FEET)

I. Pollution Hazards	
Score for no hazard	50
1. Population (p = population)	
a. Between radii of 1,000 ft. and 3,000 ft.	$-2\sqrt{p}$
b. Between radii of 500 ft. and 1,000 ft.	$-5\sqrt{p}$
c. Within radius of 500 ft.	$-10\sqrt{p}$
2. Sewers, cesspools, etc., within 500 ft.	—10
3. Improperly protected top	—5
4. Leaky casings	—5
5. Connections with polluted surface water	—10
6. Flooding of vicinity by sewage-polluted surface water	—5
7. Distribution hazards	
The same as for surface supplies	
II. Protective Measures	
Total score not to exceed	20
1. Depth and kind of strata penetrated	
Sand under 20 ft. in depth	5
Sand over 20 ft. in depth	15
Sand and gravel under 20 ft. in depth	3
Sand and gravel over 20 ft. in depth	10
Seamy rock and limestone	0
2. Purification methods	
Credits and penalties the same as for surface supplies	
III. Quality Condition	
The same as for surface supplies	

GROUND-WATER SUPPLIES

SUB-GROUP—DEPTH MORE THAN 500 FEET

I. Pollution Hazard	
Score for no hazard	50
1. Population (p = population)	
a. Within radius of 3,000 ft.	$-\sqrt{p}$
Other pollution hazards the same as for main group	
II. Protective Measures	
Total score not to exceed	20
1. Overlying soil	
Same as for main group	
2. Purification methods	
Credits and penalties the same as for surface supplies	
III. Quality Condition	
The same as for surface supplies	

Conclusion

The foregoing outline constitutes the author's personal judgment as to the values which should be given the different factors entering into the appraisal of the sanitary condition of water-supplies. It is hoped that those who read this article and are interested in the problem of water-supply scoring will freely express their opinions in this connection. There are, of course, opportunities for differences of opinion in the matter of ascribing values to intangible attributes. It is believed, however, that discussion and the advancement of other opinions should make it possible to establish a rating scale which would be generally applicable with a fair degree of justice. It is further believed that if water-works officials would balance the sanitary liabilities and assets of the water-supplies in their charge according to the foregoing or some similar score system, they would discover unexpected and unappreciated hazards. With progressive water-works men a defect exposed is a defect remedied.

ACKNOWLEDGMENT.—From a paper read before the New England Water Works Association, at the 1925 Convention.

The Relation of Business Management and School Administration

THE correlation of business management and school administration of public school supervision will be the subject of a nation-wide study by a commission, four members of which have just been appointed by the Secretary of the Interior and the Secretary of Commerce. The members already appointed include John J. Tigert, Commissioner of the Bureau of Education; Thomas E. Finegan, former State Superintendent of Education of Pennsylvania; Elliot H. Goodwin, resident Vice-President of the Chamber of Commerce of the United States; Ernest Greenwood, Vice-President of the Board of Education of the District of Columbia; George D. Strayer of Columbia University, and John H. Beveridge, Superintendent of Schools at Omaha.

The commission will study business administration and methods of financing, including taxation and bond issues for school purposes, the construction and maintenance of new buildings, the purchase of sites for school buildings which will anticipate the growth of the population and provide adequate playground facilities and room for extension of the school plant, and many other details.

LAUGHS AND GROANS

Things Old and New from a Civic Scrap Book—Credited, Uncredited and Discredited

Giving Garbage a Keen Edge

The garbage collector of Westport, Conn., has refused to renew his contract; last year more than $100 worth of his pigs were killed by eating safety-razor blades thrown into the garbage.

Publicists have wondered what becomes of old razor blades; we have thought of garbage disposal in that connection, but we have always put it sternly out of mind, with the reflection that blade-eating by hogs must be confined to the razorbacks of the South.—*Collier's.*

No Danger Now!

Doctor: "Have you taken every precaution to prevent the spread of contagion in the family?"

Rastus: "Abs-lutely, doctah, we've eben bought a sanitary cup an' we all drink from it!"—*Pelican.*

There's a Reason

"Each child is burdened with $96 of public debt." We've often wondered what makes a new-born infant yell.—*Brockville (Ont.) Reporter.*

Fair Warning

$6,000,000 Realty Taken for Bridge
Commission Condemns 210 Properties, Including Church and Two Cemeteries, For Approaches.
Occupants Are Notified.

—Headlines in a Philadelphia newspaper.

Chickens and Bicycles

"I have been instructed by the Village Council to enforce the ordinance against chickens running at large and riding bicycles on the sidewalk.—Harry Shells, Village Marshal."—*From an enterprising Minnesota newspaper.*

Beware, Chicago!

"New York Woman Is Robbed in Chicago." Isn't this a violation of home rule?—*New York Evening Post.*

Hard Times for Venerable Ordinances

The city council has instructed the city attorney and prosecutor to confer with the view of wiping from the statute books all obsolete civic ordinances. Among the city laws which probably will be affected is one barring conductors and drivers of horse-drawn street cars from shooting jack rabbits from car platforms; another which forbids a mother to bathe more than one baby in the same tub at one time, and a third preventing the wearing of false whiskers on the street.—*Associated Press dispatch from Los Angeles.*

A Strong Name for the Week

This is Clean-Up Week, but they want a new name for it. How about Good Riddance Week?

—*"F. P. A." in the World, New York.*

Her Immunity

After the epidemic had been checked, an old negress protested vigorously when the health officers started to take down the sign they had put on her house.

"Why don't you want us to take it down?" one of the officers asked.

"'Ere ain't be'n a bill collectah neah dis house sence dat sign was nailed up. You-all please let it alone."—*People's Home Journal.*

No Rehearsal

"Who's dead?" asked the stranger, viewing the elaborate funeral procession.

"The man what's inside the coffin," answered a small boy.

"But who is it?" the stranger pursued.

"It's the mayor," was the reply.

"So the mayor is dead, is he?" mused the stranger.

"Why, of course he is," said the small boy witheringly. "D'you think he's having a rehearsal?"

—*State Service.*

The Limit

Kriss: Gray is an ungrateful cuss.

Kross: What's he done now?

Kriss: He won $100 for a slogan to boost his home town and used the money to move away.

Had a Complaint

The angry citizen puffed into the office of the city editor.

"See here, sir," he yelled, "what do you mean by publishing my resignation from my political office in this way?"

"You gave the story yourself, didn't you?" asked the editor.

"Of course I did," replied the angry citizen, "but your fool paper prints it under the head of Public Improvements."

Trafficking in Humor

We notice the automobile manufacturers are again announcing new "improvements" and "refinements" in their new models. What we need now is a new type of pedestrian who won't be so easily damaged when he is bumped.—*New York Evening Post.*

A Western exchange tells of a speed maniac who ran head-on into a seven-story office building and after regaining consciousness weakly murmured, "I blew my horn."—*Boston Transcript.*

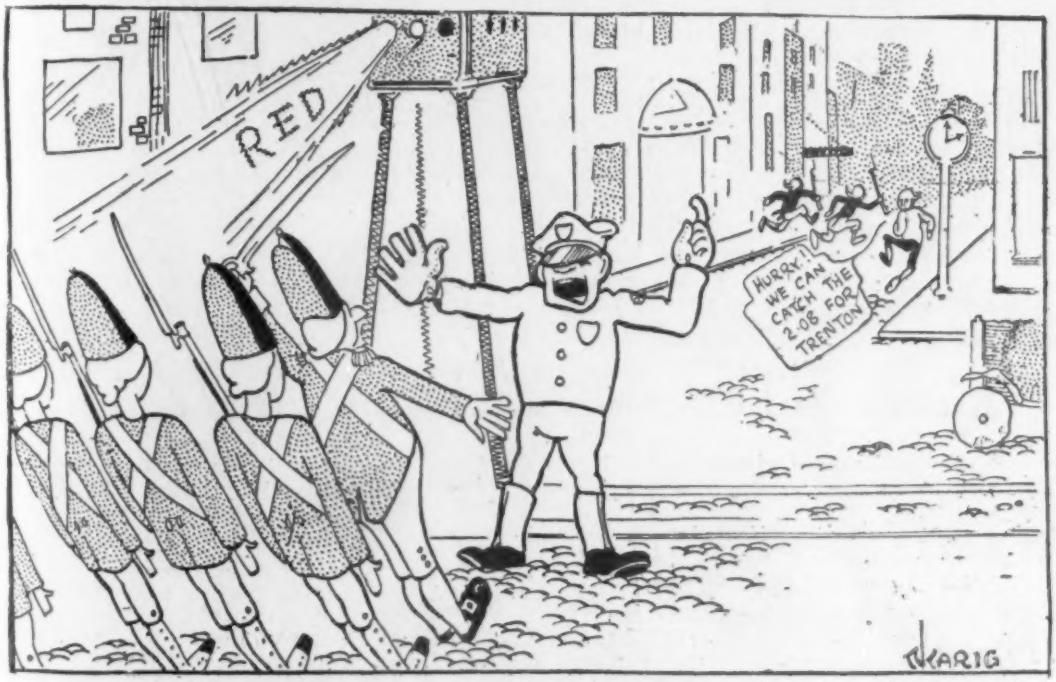
Reckless automobile driving arouses the suspicion that much of the horse sense of the good old days was possesed by the horse.—*Boston Post.*

The trouble seems to be that too many people think the law should be enforced, and not enough think it should be observed.—*Portland Telegram.*

History As It Might Have Been

If Traffic Signals Had Been Used in Revolutionary Days

A small troop of Jersey Minute Men assembled at the Newark Court House one day in 1776, when suddenly a regiment of Redcoats appeared. Resistance was futile, so the Americans fled down Market Street. The British gained at every step



By a clever ruse of the Four-Corners traffic cop, who set the signal against the Redcoats, as soon as the Yanks crossed Broad Street, the latter escaped

From a cartoon in the *Newark (N. J.) Evening News.*

Zoning Notes

Prepared by Frank B. Williams
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A Notable Decision in New York

THE city planning event of the month is, without question, the case of Wulfsohn v. Burden, Inspector of Buildings of the city of Mount Vernon, in which, by a united court, the highest judicial tribunal of the state again, and with added emphasis, affirms the validity of zoning in New York.

Under a broad zoning enabling statute, the city of Mount Vernon had passed a comprehensive zoning ordinance creating three classes of residential districts, in addition to districts for business and industry. In the A and B residential districts apartment houses were admitted only on condition that they establish larger rear court yards, and set back farther from the street than private residences; the setback being 50 feet in the A district, and 25 feet in the B district. In the present case, the regulations prevented the appellant from using about 50 per cent of his lot for an apartment house, but did not restrict him in this way in its use for many other purposes.

The Court first considered the question whether the zoning authorities would have had the power to establish residential districts devoted to ordinary family residences and exclude therefrom altogether apartment houses; for if, the Court says, "they would have had the power of exclusion, they would have a power of regulation broad enough to cover the restrictions here complained of." And the Court finds that, under the police power for the promotion of the general welfare, the authorities did have this power of exclusion, and calls attention to the constant advance of the police power in this country.

But, the Court goes on to decide, even if there were not this complete power of exclusion, the authorities could regulate apartments in residential districts, as they have done in this ordinance, for the public safety or general welfare. The validity of reasonable zoning in all its essentials is reasserted.

A minor point is so admirably treated in this decision as to call for mention; and it can best be given in the words of the Court:

> "Because the provisions permitting the erection of apartment houses provide in substance that there shall be no display of advertising visible from any street, the argument is made that the zoning regulations are based upon esthetic consideration and therefore not sustainable. If we are right that the erection of apartment houses might be altogether prohibited, then we should say that as a condition of permitting their erection the condition in question might be imposed. The restriction of advertising matter referred to in this case is a minor incident; the main regulations are of height and of open spaces, and these provisions are not rendered invalid because consideration is given to appearance of buildings as a minor and auxiliary reason. (Welch v. Sawsey, supra.)"

A summary of a discussion of zoning so full and complete as that contained in this decision is of necessity inadequate. The case must be read as a whole to be understood even in its major features.

Recent Zoning Ordinances and Decisions

Recent Zoning Ordinances

NEW BRITAIN, CONN.—Ordinance, September 16, 1925
WAKEFIELD, MASS.—By-law, November 16, 1925
OWOSSO, MICH.—Ordinance, September 28, 1925
GLENS FALLS, N. Y.—Ordinance, October 8, 1925

Other Recent Zoning Cases

LOUISIANA.—*State ex rel. National Oil Works of Louisiana v. McShane, Mayor of New Orleans; appeal from Civil District Court, Parish of Orleans.* The plaintiff is operating a filling station with sidewalk pumps at the corner of St. Charles Avenue and Gen. Pershing Street. An ordinance, effective April 1, 1925, requires sidewalk pumps to be removed. A subsequent ordinance provides that no one shall operate any garage on St. Charles Street from Jackson Avenue to Carrollton Avenue and that no building previously used for that purpose shall be remodeled. The validity of the first ordinance is not questioned. *Held* that the latter ordinance is constitutional. The validity of regulations establishing residential districts from which business is excluded is clear. The fact that St. Charles Avenue "was the first in order of time to be affected by an ordinance removing oil sta-

tions from that street alone and not from other streets, does not make the ordinance unconstitutional." There has been no unjust discrimination; all parties in the same situation have been similarly treated. The business was a nuisance in fact; but, to be abated, a business need not be a nuisance *per se*.

The fact that the plaintiff's business was established at this location long prior to the passage of the ordinance does not avail him; for a vested right cannot be asserted against the proper exercise of the police power.

NEW JERSEY.—*Scola v. Senior, Inspector of Buildings of Town of Montclair and Board of Adjustment of Montclair (Supreme Court) N. J. Adv. Rep. Vol. III, No. 47, p. 1808. November 21, 1925.* The plaintiff, denied a permit for a store and apartment house in a residential district, appealed to the Board of Adjustment of the municipality. The Board granted the permit on condition that the outside wall of the proposed building be at least 15 feet from the line of Walnut Street, and 7 feet from that of Pine Street. *Held* that the condition imposed by the Board was an arbitrary limitation on the use of plaintiff's land and therefore invalid.

NEW YORK.—*Matter of Collins v. Moore, 125 Misc. 777.* Application for peremptory order of mandamus. The premises are in a residential district, in which a laundry is not permitted. Prior to the passage of the New York City zoning resolution they had been used for business, but not, until recently, for a laundry. *Held* that the premises could not be utilized for a laundry. A business existing at the time of the enactment of the resolution may be continued, and under certain conditions the property used may be enlarged for the same business; but there cannot be a substitution of a prohibited business for another one.

NEW YORK.—*Matter of DeFine v. Board of Health of New York City, 125 Misc. 797.* Motion for peremptory injunction. In December, 1924, the premises in question were zoned as a residential district. Prior to that time a permit had been issued for the erection of a garage on the premises. In April, 1925, the Board of Health of the city approved of an application for a change of use of the premises for a poultry slaughterhouse, and the Superintendent of Buildings issued an amended permit for such construction. This motion is made by the owner of the adjacent property. The regulations of the Board of Health prescribe that no permit for a poultry slaughterhouse shall be issued unless the site is located in an unrestricted district. Motion granted. Section 6 of the zoning resolutions with regard to a change from one use to another applies only to premises not conforming to the resolution at the time of its adoption in July, 1916.

The Latest Report of the Department of Commerce on Zoning

In the Report of the Secretary of Commerce of the United States, just issued, the following interesting comments on the prevention of waste in this country by means of zoning regulations, appears:

"An advisory committee on zoning was . . . appointed by the Secretary of Commerce in 1921 to deal with another aspect of municipal building regulations. The standard state zoning enabling act which this committee prepared has been used wholly or in part by 17 states [Arizona, Colorado, Delaware, Idaho, Illinois, Iowa, Nevada, New Hampshire, New Jersey, North Carolina, North Dakota, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Utah and Wyoming] a fact which bears eloquent testimony to the value and far-reaching scope of the committee's work in this field. The number of zoned municipalities in the United States has increased to about 360 from a total of less than 50 at the time the committee was formed. As a result, several million additional home owners have better protection for their equity in their property. The zoning ordinances are helping to safeguard the houses of these families from wanton intrusion by uses of land which are best grouped apart from homes.

"Reports indicate that zoning ordinances have been helpful in cities throughout the country in avoiding the blighting of districts and the unnecessary scrapping of buildings and costly public utilities that are still serviceable. The razing of a single block of dwellings and the scrapping of utility connections unsuited for altered occupancy usually involved a destruction of $100,000 or more worth of property, depending on the number and character of houses. Where the scale of such operations is reduced by a good zoning ordinance the annual savings, even in a city of moderate size, are very considerable."

WHAT IS REGIONAL PLANNING?

City planning has been defined as the conscious attempt to make the city of the present and of the future a home which shall be healthful and happy for its people; a workshop which shall be wholesome and efficient for its workers.

An adequate planning program is concerned with every phase of the physical aspects of the city. It contemplates the orderly and logical development of the city's facilities that they may adequately serve not only immediate needs, but future requirements as they shall arise. City planning is usually confined within the political boundaries of the community.

Regional planning is but an extension of the planning program to include the economic and social boundaries of the city, which usually extend far beyond its political boundaries. It is concerned with the physical needs of that region whose life is largely dependent upon or influenced by the activities of the central city. It looks upon the problems of the various communities within the metropolitan district of a large city, as but parts of a single regional problem. It realizes that the solution of these problems can be reached only through regional study and cooperative action.

—City Club News, Philadelphia.

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Municipal Control Over Bus Transportation

EXCEPTING as the state transfers powers from cities to a public utility commission, or other state agency, and excepting as interstate transportation is exempt from local control, the municipal prerogative over motor carriers for hire is generally treated by the courts as being very broad.

The principal ground upon which the control may be exercised was thus stated by the Georgia Supreme Court in the very recent case of Schlesinger vs. City of Atlanta, 129 Southeastern Reporter, 861:

"The conduct of the business of a carrier of passengers for hire over streets of a city is a mere privilege, and not a natural or inherent right of the individual conducting such business. Being a privilege, it can be given or withheld, and may be given to members of one class and denied to those of another class. If the state or city determines that the use of the streets for private purposes in the usual and ordinary manner shall be preferred over their use by common carriers for hire, there is nothing in the Constitution of the United States or this state which prohibits such action."

The Kentucky Court of Appeals states the ground in this language:

"It was never contemplated that the highways should form a part of the capital stock of common carriers engaged in the transportation of persons or property for profit, or that the use of the highways should be donated to them for that purpose.

"Clearly, these companies have no vested or inherent right in the highways, and their unrestrained use thereof is equivalent to an appropriation of public property for private use, and it is within the power of the Legislature to prohibit the use or to prescribe the terms upon which it may be exercised." (Reo Bus Lines Company vs. Southern Bus Line Company, 272 Southwestern Reporter, 18.)

But, since the Federal Constitution gives Congress exclusive control over interstate commerce, state or municipal power to interfere with the operation of interstate lines is limited. The highest court of the land has, in several cases, defined the bounds of local jurisdiction. In one of these cases—Hendrick vs. Maryland, 235 United States Supreme Court Reports, 610—it is said:

"In the absence of national legislation covering the subject,* a state may rightfully prescribe uniform regulations necessary for public safety and order in respect to the operation upon its highways of all motor vehicles—those moving in interstate commerce as well as others. And to this end it may require the registration of such vehicles and the licensing of their drivers, charging therefor reasonable fees graduated according to the horse-power of the engines—a practical measure of size, speed and difficulty of control. . . . The reasonableness of the state's action is always subject to inquiry in so far as it affects interstate commerce, and to that regard it is likewise subordinate to the will of Congress."

There is a distinct trend toward restricting the control of cities over interurban intrastate traffic, by vesting in the state public utilities commission, or other similar body functioning in a particular state, general control of transportation for hire by motor vehicles over fixed routes. Interpreting provisions of the Ohio statutes and constitution—not differing essentially from those in force in other states—the Supreme Court of that state lately said, in the case of Lorain Street Railroad Company vs. Public Utilities Commission, 148 Northeastern Reporter, 577:

"If the municipality does not interfere with the general powers of the Public Utilities Commission, it may, by suitable police regulations, control, direct, and manage its streets and the traffic thereon, and the conclusion reached is that these ordinances are not an unreasonable local police regulation relating to traffic, reciting as they do that it is intended to make the streets less congested and less dangerous to pedestrians and the public generally, and may be so enforced as not to materially lessen the efficiency of the utility. Of course, under the guise of so regulating traffic, a city may not materially interfere with the general efficiency of the utility authorized by the Public Utilities Commission within its jurisdiction."

An example of an ordinance found to unreasonably encroach upon the powers of the Public Utilities Commission is afforded in another case decided by the same court, City of Nelsonville vs. Ramsey, 148 Northeastern Reporter, 694. There the ordinance recited that the public generally was adequately served by existing transportation facilities and that motor-busses, etc., were creating congestion and

*Such legislation is now in prospect.

danger. It was therefore declared that motor-busses should not be operated over streets occupied by street-car or interurban car lines. The ordinance was held to be void as applied to interurban busses sanctioned by the Public Utilities Commission, for the reasons stated below. The Ohio Supreme Court said:

"The city of Nelsonville had a right to make reasonable police regulations within its boundaries with reference to traffic on its streets and the use thereof by the public. This would mean such regulations with reference to right or left turns, one-way streets, stops at certain points where safety and local conditions required it, and such other matters of purely local concern which affect peculiarly the municipality. . . .

"The Public Utilities Commission should at all times give due consideration to local conditions, which are best known to municipal authorities. At the same time it must not be overlooked that the Public Utilities Commission is intrusted with the duty in the interest of the public of securing for the public adequate service from public utilities, and for the convenience, necessity, and safety of the public in matters of travel upon the public highways of the state. . . .

"It appears that to divert this bus transportation line from the route fixed by the Public Utilities Commission, the busses would have to travel a considerable distance out of the way of the route prescribed by the commission over a dirt road wholly unimproved, in some places narrow and full of ruts. . . . This species of detour, especially when the unimproved roads were muddy, rough, and in a condition difficult for motor travel, must materially interfere with the efficiency of the utility and render the service to the public, authorized by the commission, less effective to the public."

In the opinion of the Georgia Supreme Court, above cited, the general rule that, as to intraurban traffic, a city has broad power to either forbid use of the streets by common carriers of passengers and goods by motor vehicle, or to prescribe the conditions upon which they may be so used, is supported by a reference to opinions of the courts of Iowa, Texas, Washington, West Virginia, Louisiana, Delaware, New York, Michigan, Kansas, Pennsylvania, South Carolina, Florida, and Massachusetts.

Items of Municipal Law

Theory and Validity of City Manager Plans

So far as concerns the power of a state legislature, in dealing with cities under its control, and the power of home-rule cities in dealing with their own affairs, it must be taken as firmly established that the government of a city may be entrusted to a commission or a city manager. The general principle has been upheld in several decisions of courts of last resort.

"The growth of municipal government to the degree of perfection claimed by those who favor the commission plan is upon the theory that a city's functions have become more and more ministerial, in that its duties consist largely, if not entirely, in the management of public utilities, such as water-works and sewerage systems, electric lighting and power plants, gas plants, telephones, and street railways—all properties not of the state, but of the people of the community or city, which are managed for the financial advantage and profit of the city," declared the Florida Supreme Court in the case of Kaufman vs. Tallahassee, 94 Southern Reporter, 697. "Courts upholding the constitutionality of such plans of municipal government do so upon the ground that the constitutional division of the powers of government into three departments, and forbidding persons belonging to or performing the functions of one department from exercising any powers appertaining to either of the others, does not apply to municipal corporations."

As an incident of this modern thought, the Court argues that municipal responsibility for injuries resulting from operation of its instrumentalities, such as fire-trucks, is to be enlarged. The opinion says:

"It requires very little stretching of this doctrine to say: Therefore no municipal function is governmental; a city is not a political subdivision of the state, not a government, but purely a business, commercial, proprietary management of local public interests."

License Tax Ordinance Void as Burdening Interstate Commerce

It has been long since firmly established by decisions of the highest court of the land that neither a state nor a city can tax the business involved in taking orders for transmission to a non-resident seller, to be acted upon in another state and there filled if accepted. Such business constitutes interstate commerce, which Congress alone can tax.

The city of Portland, Ore., passed an ordinance in 1923, imposing a license fee upon, and requiring a bond of, every one taking orders for goods for future delivery and receiving a deposit of money on the order. The ordinance has been held by the United States Supreme Court to be void as applied to solicitors negotiating contracts for purchase of goods in the city, although they formed agreements binding their non-resident principal to deliver, and accepted deposits which constituted their compensation for negotiating the sales; the balance being collected by the principal through making c. o. d. shipments. Says the Supreme Court:

" 'The negotiation of sales of goods which are in another state, for the purpose of introducing them into the state in which the negotiation is made, is interstate commerce.' Manifestly, no license fee could have been required of appellant's solicitors if they had traveled at its expense and received their compensation by direct remittances from it. And we are unable to see that the burden on interstate commerce is different or less because they are paid through retention of advance partial payments made under definite contracts negotiated by them. Nor can we accept the theory

that an expressed purpose to prevent possible frauds is enough to justify legislation which really interferes with the free flow of legitimate interstate commerce." (Real Silk Hosiery Mills vs. City of Portland, 45 Supreme Court Reporter, 525.)

Municipal Control Over Interstate Ferries

While the states, and consequently municipal corporations acting upon their authority, may adopt and enforce reasonable regulations for the safety and convenience of the public using ferries, and may fix reasonable rates to be charged in carrying passengers, vehicles, and freight from their own shores, they cannot prohibit the operation of a particular ferry nor exact a licensee fee for the privilege of landing or taking on passengers, etc., declared the United States District Court for the Western District of Louisiana in the recent case of McNeely vs. Mayor and Board of Aldermen, Town of Vidalia, 6 Federal Reporter, 2d Series, 21, following what the United States Circuit Court of Appeals had decided in an earlier case involving the same ferry—that extending between Natchez, Miss., and Vidalia, La. It was decided that the fact that an existing ferry may have charged exorbitant rates and rendered insufficient service would not justify either of the terminal cities in granting an exclusive franchise to another ferry operator, on the theory that more than one ferry would not be profitable and that granting of the new franchise was necessary in order to secure the establishment of good service at reasonable rates.

Contracts to Influence Council Action Are Void

In an interesting case submitted to the Minnesota Supreme Court, plaintiffs sought to hold a telephone company to an agreement for special and favorable rates for telephone service, in consideration of plaintiffs' use of their influence to "prevent telephone agitation" in the city and to promote friendly relations between the telephone company and its patrons. Holding that this contract was unenforceable, the Court said in the case of Goodrich vs. Northwestern Telephone Exchange Co., 201 Northwestern Reporter, 290:

"A contract based upon an illegal consideration is void. A city council should always be free to exercise its judgment and discretion, in making contracts for the city, so that it may contract with persons who will execute them most faithfully, and at the least expense to the taxpayers. Considerations as to the most efficient and economical mode of meeting the public wants should alone control. It must at all times be a free agency to obtain and give service. Such rule is dictated by public policy, and whatever violates this rule is against public policy. The restriction upon the council now under consideration, placed there by a majority of its members, and the agreement, by private citizens, to use their influence upon the existing and future councils, introduce elements into the transaction that do not have the approval of public policy. Assuming that the three members of council, who were not parties to this agreement, but who were, perchance, the unconscious victims of this contractual influence, would try to follow the dictates of their judgment and discretion in matters incompatible with the secret consideration of this agreement, we can readily see how the efficiency of their ability would be throttled by the invisible, but controlling, influence. Such extraneous secret influence on legislative officials received, perhaps, in the best of faith as coming from a free and untrammeled motive, is dangerous in the extreme."

City Held Liable for Death Caused by Polluted Drinking Water

In the case of Aronson vs. City of Everett, 239 Pacific Reporter, 1011, the Washington Supreme Court affirmed judgment in favor of plaintiff for $6,000 on account of death resulting from drinking polluted water supplied by the city. The Court held that it was not necessary that the complaint specify the cause or place of pollution; that a cause of action was stated by allegations that the water became polluted to the knowledge of the city's officers, or should have been so known in the exercise of ordinary care, and that a consumer contracted a disease from the pollution and died. Referring to decisions of the Court of Appeals of New York and of the Supreme Court of Wisconsin, the Washington Court remarks:

"While both cases hold that a city furnishing water to its inhabitants does not impliedly warrant that the same is pure and wholesome, yet both of these cases recognize that the failure to properly inspect the water so as to keep it free from contamination is negligence. There is ample authority that a city engaged in furnishing water, electricity, or other kindred services to its inhabitants for a profit is liable for negligence the same as any private corporation engaged in the same business, that the city does not act in a governmental capacity, and that there is an implied warranty that the water is fit for human consumption."

Decisions of the highest courts of Connecticut, New Jersey and Maine are cited in support of the last-stated proposition of law.

City Treasurer's Responsibility as to Funds

Where by state statute, charter or constitutional provision a city treasurer's duties are prescribed, he cannot justify an improvident disposal of municipal funds on the ground of compliance with a direction by the city council, according to the decision of the Virginia Supreme Court of Appeals in the case of Camp vs. Birchett, 129 Southeastern Reporter, 324. Of a city treasurer the Court said:

"It was the duty of Craft to safely keep the money of the city of Hopewell; the responsibility and duty were his alone; and, if he deposited or left money in an insolvent bank, he and his surety are liable for its loss."

Power of Municipality to Control Bill-Boards on Private Property

In the case of Commonwealth vs. McCarthy, 17 Pennsylvania Municipal Law Reporter, 32, an Allegheny County court recently recognized that a municipality may regulate the erection of bill-boards on private property, in the interest of public safety. But it was decided that an ordinance forbidding erection of such structures on private property, without regard to public safety, is invalid as an unwarranted interference with private property rights.

Forward Steps in Municipal Affairs

Vehicular Tunnel Relieves Congestion at Ferry and Street-Car Terminal

SAN FRANCISCO, CALIF.—San Francisco's first vehicular tunnel, at the Market Street terminal, is fulfilling its object in relieving traffic congestion along this busy section of the water-front. Its benefits are being realized by three distinct groups. Shipping concerns, manufacturers, and others who have occasion to transfer goods along the Embarcadero, the street running parallel with the water-front, find that trucking has been speeded up approximately 25 per per cent at this particular point; the Market Street Railway Company and the Municipal Railway, which have their terminals at the Market Street Ferry, no longer find their schedules delayed through the congestion of vehicles at this end of their routes; and the daily stream of commuters on their way to and from the ferry are able to cross the intersection with greater ease and safety.

A traffic count made shortly before the subway was open showed that between the hours of 7 A. M. and 6 P. M. approximately 8,000 vehicles passed along the Embarcadero at the foot of Market Street. The congestion was so great as to result in an accumulated cessation of street-car movement of four hours and forty-eight minutes during the eleven-hour period, and a tie-up of vehicular traffic totaling six hours and

ENTRANCE TO TRAFFIC SUBWAY, SAN FRANCISCO

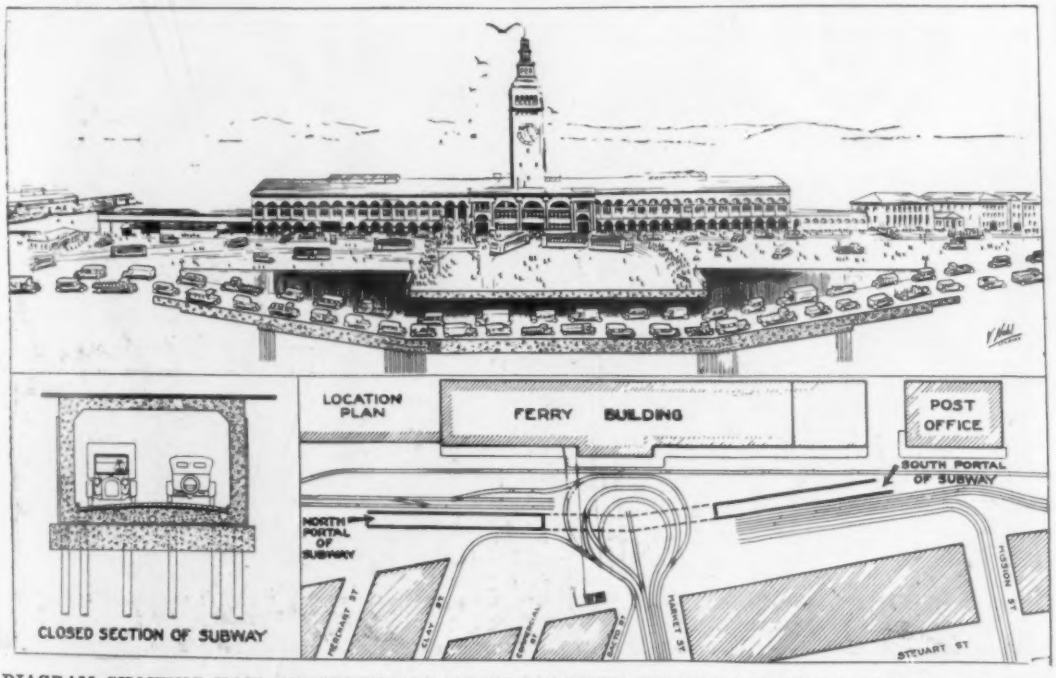


DIAGRAM SHOWING HOW CONGESTION IS BEING RELIEVED BY THE VEHICULAR TUNNEL AT THE FERRY BUILDING, SAN FRANCISCO

twelve minutes.

When the present Board of Harbor Commissioners came into office in 1923, an announcement was made that the Harbor Commission would undertake the construction of a vehicular subway at Market Street if a satisfactory plan of financing could be worked out. Since the proposed subway was obviously a water-front improvement, the Commission expressed its willingness to bear one-half the expense involved. The two street railway companies were then approached on the subject, and they each agreed to contribute one-eighth the cost. The remainder was met by an appropriation from the city.

The construction work, under the direction of Frank G. White, Chief Engineer of the Harbor Commission, was started in December, 1923, and the tunnel was completed in 1925 at approximately its estimated cost of $350,000. The subway has a total length of 986 feet, including two approaches of 298 feet each, and a closed section of 390 feet. The roadway, 23 feet in width, accommodates trucks moving in single file in both directions, and a railing has been run through the center to eliminate the possibility of accident through the practice of cars attempting to pass one another out of line. The structure is of reinforced and waterproofed concrete, and the payed floor is kept dry through the automatic operation of an electrically driven centrifugal pump.

Most of the horse-drawn trucks are now diverted around the terminal, crossing Market Street at a short distance from the ferry, for the reasons that the grades at the entrances to the tunnel prove somewhat of an obstacle to horses, and that these vehicles slow up the faster-moving automobile trucks.

CHARLES H. SPEAR,
President, Board of State Harbor Commissioners of California.

More Adequate Fire Protection for the Los Angeles Harbor

Los Angeles, Calif.—More adequate fire protection in the harbor of Los Angeles has been assured by the recent addition of a new modern fire-boat to the marine apparatus of the Fire Department.

In the last few years the port of Los Angeles has become one of the most important oil-shipping points in this country, and the total volume of commerce in the harbor has increased beyond expectations. The docks and wharves constructed to meet the demand extend over such a wide area that the one fire-boat of the Department afforded entirely insufficient protection. A bond issue of $400,000 for the provision of a second boat was therefore put before the voters last year, and their approval of the project has made possible the purchase of the Los Angeles No. 2.

After some consideration, tentative plans for the building of a 150-foot boat were abandoned in favor of a smaller boat, the idea being that if sufficient funds remained, a third boat might be added to the Department's equipment. The boat just completed represents an expenditure of $214,000, which, with an additional allowance of $75,000 for the construction of a new fire-boat house and slip, leaves a balance of approximately $100,000. While this sum will not make possible a duplication of the Los Angeles No. 2, it will no doubt go far toward providing a smaller craft with worth-while equipment.

In a successful test in the harbor of the equipment of the new boat shortly after its launching, it was found that its six pumps will each deliver 2,000 gallons per minute at 200 pounds pressure, aggregating 12,000 gallons per minute through 29 streams. In conjunction with the fire-boat there are operated two "tender" companies which are

THE NEW LOS ANGELES FIRE-BOAT IN ACTION IN THE HARBOR

really a part of the fire-boat service. The trucks furnished by this service respond with hose and other equipment to any fire to which the fire-boat is called, and are necessary for the handling of the very heavy 3½-inch hose. They each also carry a battery mounted on the truck-bed, the same as the fire-boat batteries.

F. SHIRLEY,
Executive Clerk, Fire Department.

Simple Plan Reduces Basement Fire Losses

VINCENNES, IND.—There is no doubt that one of the most troublesome and dangerous phases of fire fighting is that of combating fires in the basements of buildings, such fires being particularly hazardous when the firemen have no knowledge of the layout of the basements.

After having had a number of experiences with basement fires, some of which resulted disastrously, the writer originated the following simple method of aiding the firemen in such cases. The arrows shown in the accompanying diagram, each

AN ARROW WITH A SQUARE SIGNIFIES THERE IS A COAL-BIN IN FRONT OF THIS BASEMENT OUTLET

AN ARROW WITH THE LETTER F SIGNIFIES THERE IS A FURNACE IN THE BASEMENT

AN ARROW IN A SQUARE MEANS THERE IS NO WAY TO GET INTO THE BASEMENT FROM THE OUTSIDE; THE FIREMEN MUST GO THROUGH THE DOOR AND WORK FROM THE INSIDE

AN ARROW WITH A NUMBER MEANS THERE IS A PARTITION IN THE BASEMENT AND THERE ARE OTHER OUTLETS TO FIGHT THE FIRE FROM

ONE ARROW SIGNIFIES THAT THERE IS A CLEAR PASSAGE FOR THE FIREMEN WITH THEIR WATER LINES TO ANY PART OF THE BASEMENT FROM THIS OUTLET

having a definite significance understood by the members of the Fire Department, are painted in red on all side- or front-sidewalk openings to the basements of business buildings. The precaution has also been taken to duplicate the signs on the walls opposite the sidewalk signs, since the latter are apt to be covered by snow and ice during the winter months. This scheme affords the firemen at a glance a mental vision of the general plan of the basement which they are entering.

Since this simple plan has been in effect in Vincenses, basement fire losses have been reduced to a minimum in this community.

M. LA COSTE,
Chief, Vincennes Fire Department.

One Way to Tame the Motor Maniac

CLEVES, OHIO.—This village was troubled by motor maniacs during the early months of last summer, and when the usual punishments of fines and license suspension worked no cures, a more drastic step was taken. The Mayor decreed that the automobiles of convicted traffic law violators be locked in their owners' garages, the locks sealed, and the keys placed in the Mayor's possession.

On July 4 there were brought before the writer three persons accused of violating automobile traffic laws. One had been arrested for speeding, the other two for reckless driving. Each had been arrested for similar offenses before and had paid their fines. The suspension of their right to drive had previously been, to them, a joke, since it was not difficult to find friends to drive their cars while they themselves enjoyed the scenery as passengers. To make the suspension effective, it was evident that the violator must be deprived of the right to *use* his automobile during the specified period. This made it necessary to make a prisoner of the car.

There was a noticeable decrease in the number of traffic law violations during the remainder of the summer, and of those who were deprived of the use of their machines for a period, none has since been cited for a repetition of the offense. When the young blood—and over 75 per cent of our traffic law violators are of the younger set—finds his plaything locked up because he has misused it, he is usually willing to listen to reason.

Officials in other cities who are troubled by those who have no respect for the law, might find this method of cure worth a trial.

D. W. GWALTNEY,
Mayor.

160-Acre Tract a Gift to City

SHREVEPORT, LA.—This city is indebted to one of its local real estate firms for the gift of an exceptionally desirable tract of land covering 160 acres, and the possibility of using this land for the construction of an 18-hole municipal golf course is now being considered. The site is within a 20-minute drive of the city, with a new subdivision rapidly expanding in that direction. The development of the area will be commenced as soon as funds are available.

GROVER C. THAMES,
Supervisor, Department of Recreation.

Good Government Through Citizenship Service

My observation is that good government is a difficult achievement. Somehow, governments don't have a way of functioning by themselves. It is a controversy between the place holder and the man who has some flair for public service. I have found that the best method of eliminating discord is to appeal to the members of the community who have the urge to do something useful for the government. You can always draw on that element in the community with a good deal of reliance, and that is where the solution to the problem of good government lies.—JUSTICE HARLAN F. STONE.

Service, Fees, and Methods of a Small City's Building Department

By William H. Switzer

Inspector, Department of Buildings, New Rochelle, N. Y.

DURING the year 1925 the total volume of building in New Rochelle approximated $10,000,000. Fees are collected at a minimum rate of $1 for the first $1,000 or any part thereof, and a fee of 50 cents for each additional $1,000 or major portion thereof of the construction cost of a building or structure. Collection fees for signs and billboards range from $1 to $10. Areaway rentals ranging from 15 to 25 cents per square foot are collected for vaults or open areas under public sidewalks.

These various collections provide revnue which is slightly less than the total expenditures of the department, inclusive of salaries and current office expenses. An increase in the rate from 50 to 75 cents per $1,000 for building permits would mean a self-sustaining department, besides permitting increased facilities.

"It Is Not the Business of the Department to Superintend the Construction of a Building"

A modest notice bearing the above quotation posted in a conspicuous place greets the eye of those who deal with the Bureau of Buildings of New Rochelle. In cities other than those of the first class it is not uncommon for home owners and, in some instances, builders and architects to assume that the payment of a small permit fee entitles them to supervision, and places full responsibility on the Building Inspector. Obviously, such an assumption is ridiculous, as a small army of deputies would be required to cope with the situation.

What does the owner, builder, or architect receive in return for the fees paid? How does the service benefit the taxpayer at large? The personnel consists of the head of the department (Inspector of Buildings), one Deputy Inspector, one Plumbing Inspector, and one Engineer of Structures. The duties consist of clerical work, examination of plans for compliance with the zoning ordinance and building code, examination of materials of construction, and inspection of structures from beginning to completion. Permits are issued from within 24 to 72 hours after date of application when such applications comply, or can be corrected to comply, with the various ordinances. In a vast majority of cases the department suggests the proper corrections to comply with regulations affecting zoning, strength, safety, and fire.

This procedure obviates the necessity of returning plans for non-compliance with designated sections of city ordinances, and eliminates a reexamination or duplication of work. In turn, the clerical work of the office is accelerated and the necessary filing incidental to disapprovals is eliminated. Owners, builders, and architects are in this manner permitted to proceed, with no delays. In the event of further delay due to incomplete plans, temporary permits for excavation and in some instances for foundations are issued.

All new types of building material are subjected to standard tests at the expense of the manufacturer and are approved or disapproved according to their merits and use. In many instances the materials are found to be faulty and are rejected. Those that do comply effect a considerable saving to the owner. The taxpayer at large is benefited by the protection afforded the community in the regulation of light, air, ventilation, and safety from fire or collapse, all of which has a direct bearing on health, values, and insurance. Field inspections are made daily by the Building Inspector and the Plumbing Inspector, covering an area of 10½ square miles.

One of the greatest sources of trouble for the department is that of the amateur architect, and of the owner who releases a good architect after having completed plans and specifications. The amateur architect delineates without thought or knowledge of the final outcome. Bearing members are misplaced and beams crossed in such a manner that very often a slender stud or a light floor beam is expected to carry tons of weight. Were these facts to pass unnoticed by the department,

many a home would depreciate in value and the larger structures might prove unstable.

Concerning the owner who thinks he is saving money by not employing his architect for complete supervision, it has been the experience of this office that the eventual loss is greater than the anticipated saving. The average man lacks knowledge of the reasons for good architectural design. As a result, if the architect is not retained to supervise construction, the very backbone of a structure may be omitted, substituted, or shifted so as to be of little or no value and undue strains placed on the weaker parts. The tale of unsupervised construction is told in cracked ceilings, cracked corners and walls, depressed floors, steps and risers of varying widths and heights, doors opening directly on stairs without landings, chimneys that do not draw or which have no flue lining, and woodwork in close proximity to fireplaces. Such flaws the department aims to prevent by urging property owners to employ and retain competent architectural services.

Pedestrian Tunnels for School Children

By Miller McClintock

Director, The Albert Russell Erskine Bureau for Street Traffic Research, University of California, Los Angeles

LOS ANGELES has for a number of years been seeking a solution for the problem of accidents to school children. Various types of traffic regulation have been used with varying success, but none has promised a complete or permanent solution. The pedestrian tunnel has finally been chosen as the most perfect protection.

A $350,000 bond issue was recently approved, and construction will soon begin on forty pedestrian tunnels designed for the protection of school children. The bond issue was approved chiefly on the basis of the excellent showing made by an experimental tunnel constructed about two years ago.

This experimental tunnel proved conclusively that traffic accidents at public schools could be almost entirely eliminated. Through the cooperation of the school authorities, practically 100 per cent of the children at this school use the tunnel for crossing an important traffic artery. It has also appealed to adults.

Photograph by J. C. Milligan, Los Angeles

STAIRWAY TO PEDESTRIAN TUNNEL USED BY SCHOOL CHILDREN IN LOS ANGELES

All of the forty tunnels to be constructed will be located in close proximity to public schools. The locations were determined after a comprehensive survey of traffic conditions, the study involving a check of the number of vehicles, the number of children, the speed of vehicles, and the width of the roadway. Care was taken to see that none of the tunnels should be located at places where traffic control signals are to be installed in the future. According to the Los Angeles traffic code, the movements of pedestrians are synchronized with vehicular movement at all controlled intersections; therefore tunnels would be superfluous at such corners, for

pedestrians are given alternate right-of-way with traffic.

The tunnels themselves will be 7½ feet high and 6 feet wide, constructed of reinforced concrete and provided at each portal with stairways. It has been estimated that each tunnel will cost approximately $7,500 to build.

In addition to the almost perfect protection offered by the tunnels, they are also considered to be a source of economy. At each of the locations where the tunnels are to be constructed it is now necessary to station a police officer for the greater part of each school day. These officers will not be needed with the protection afforded by the tunnels. Savings in police pay alone will equal the cost of the tunnels in a few years, and they will remain as a permanent protection.

Photograph by courtesy of R. T. Dorsey, Inspector for Traffic Signals, Los Angeles

AT CORNERS HAVING TRAFFIC SIGNALS IN LOS ANGELES, PEDESTRIANS ARE GIVEN ALTERNATE RIGHT OF WAY WITH VEHICULAR TRAFFIC

An additional economy is to be seen in the saving to the motoring public. At the present time all traffic must be stopped periodically at public schools to permit children to cross the streets. Most of these crossings are at places where there is not sufficient cross-traffic to warrant "stop and go" regulations. With the tunnels constructed, motorists will be relieved of the necessity for frequent and inconvenient stops.

When the first experimental tunnel was proposed, the question was raised by a number of citizens as to the ability of public officials to keep such a subterranean structure in a sanitary condition, and to prevent crimes from taking place within them. As an answer to the first part of the objection, the experimental tunnel was so constructed with drains connected to the adjacent sewerage system that it was possible to flush it occasionally. The general care of the sanitary condition of the tunnel is given to the janitor of the adjacent school. No crimes of any kind have been reported in the tunnel, and it has been felt that general police protection will reasonably prevent such occurrences. The walls of the tunnel have been painted white, and it is adequately lighted at all times.

After the present program of tunnel construction has been completed, the Los Angeles Traffic Commission will propose another unit of tunnels for public schools, and for congestion relief in the business portion of the city.

Safety in Winter Sports

RECOGNIZING the fact that winter sports are steadily growing in popularity and scope, the *National Safety News*, in cooperation with the Playground and Recreation Association of America, has prepared and published in its issue of December, 1925, detailed suggestions for the promotion of safety in these sports.

Winter sports should certainly be provided, but every effort should be made to see that they are as far as possible proof against accidents. There are two ways in which this may be accomplished: (1) in the provision of facilities, such as ski jumps and toboggan slides which are constructed to insure safety, and in the setting aside of safe places for skating and coasting; and (2) in the administration of these facilities in a way which will make for safety.

For the guidance of city officials and others, proposed sets of regulations, based on the experience of a number of cities, are included in the article. These cover closed streets for coasting, with additional rules for coasting carnivals; ice skating and ice hockey. tobogganning, with important items in toboggan and toboggan slide construction; and suggestions for the construction of an amateur ski jump, illustrated by a diagram.

Solving the Problem of Increased Well-Water Supply at Madison, Wisconsin

By L. A. Smith
Superintendent of Water-Works

THE city of Madison, Wis., obtains its water-supply from thirteen deep wells, eleven of which are grouped around the pumping-station, with an average spacing of about 600 feet. These wells are pumped by the air-lift system into a surface reservoir, from which the water flows by gravity to the high-service pumps. The compressors and pumps are steam-driven and located in one central station, air and water lines running to the individual wells.

In 1923, because of the rapid growth of the city, the supply became inadequate, and an analysis of the situation developed the fact that an additional supply of at least 3,000,000 gallons per day should be provided. Three methods of increasing the supply were considered:

(1) Developing additional wells as part of the present group.
(2) The use of water from Lake Mendota.
(3) Developing additional isolated wells, to be pumped directly into the mains.

In order to obtain the additional 3,000,000 gallons per day required by adding to the station group, three wells would be necessary. The cost of drilling and equipping a million-gallon well is approximately $10,000. Including the additional pipe lines, the total improvement would cost $50,000.

The second method, involving the use of lake water, was very unpopular with the citizens of Madison, who were willing to pay the higher cost of well water because of its organic purity. Further consideration of this method was therefore abandoned.

The third method involved the drilling and equipping of only two wells, as the capacity of isolated wells was estimated to be 50 per cent greater than that of group wells, on account of less interference. Because of the distance from the pumping-station, air-lift was unsuitable, and the estimate was based upon the use of motor-driven deep-well pumps. Including pump-houses, property, and necessary connections to the distribution system, the estimated cost of these two units was $50,000. The study therefore developed into a comparison of the relative merit of adding to the group wells, or of drilling isolated wells.

The advantages of adding to the group system were as follows:

(1) The air-lift is an exceedingly reliable method of pumping, especially if steam-driven air-compressors are used.
(2) The additional attendance cost was an almost negligible item.
(3) The necessary equipment, such as boilers and compressors, was already installed.
(4) Centralization of equipment, a desirable feature in case of necessity of water treatment, would not be disturbed.
(5) The aeration of the water in air-lift pumping is desirable because of the precipitation of iron compounds.

The main objection to adding to the group system was that the pumping of additional water from the ground in the vicinity of the group would accelerate the rate of lowering the level of the water in the ground.

The advantages of using isolated individual deep-well units were as follows:

(1) The specific capacity of such wells is greater, and if they were properly located there would be no interference.
(2) The power cost would be less because the head would be less, and turbine pumps are 50 per cent more efficient than air-lift.
(3) Water would be pumped into the distribution system several miles from the station, rendering additional feeder mains to those districts unnecessary.
(4) The units as contemplated were complete pumping-plants, and would not be affected by any difficulties at the main station.
(5 Lower pressures could be carried in the distribution system, as the friction loss would be materially reduced because the water would be used nearer the source of supply.

The main disadvantage was the greater possibility of an interruption of service due to the electric power outages, and the greater length of time necessary to pull and repair deep-well pumps and motors.

It was apparent that there was no way of eliminating the objection to adding to the sta-

tion group, as the ground water level was certain to drop if more water were pumped from the sandstone formation in the vicinity of the group. If a sufficient elevated storage were provided, however, the effect of interrupted service or an enforced shut-down for repairs to the deep-well pumps would be eliminated. A high-service reservoir had been contemplated for some time, and was authorized before a final decision was made in the matter of increasing the supply. We therefore decided to drill and equip two isolated wells to pump directly into the mains.

Unit Well No. 1 was designed to be used during the peak domestic demand, and as it would run nearly every day in the summer, the cost of pumping was a primary consideration and it was decided to limit the capacity to 1,200 gallons per minute in order to avoid an excessive pull-down. The well was located in the western portion of the city about three miles from the station group and was 16 inches in diameter and 840 feet deep. A four-stage Aurora pump with rubber bearings was installed, driven by a 125-h.p. Allis-Chalmers motor, using Sundh control. The discharge line was 10-inch. The total cost of the installation including the site, pump-house, discharge line, meter, and pumping equipment was approximately $20,000. The cost of operation is about $30 per million gallons, of which $20 is for electricity, $5 for operation, and $5 for fixed charges. The wire-to-water efficiency is approximately 62.4 per cent when pumping 1,200 gallons per minute against a head of 190 feet.

Unit Well No. 2 was designed for fire use, and in this case the largest possible amount of water was desirable even though the cost per million gallons were greater. The well was located in the southern portion of the city about two miles from the station group and was 38 inches in diameter and 795 feet deep. A six-stage Layne & Bowler pump was installed, driven by a 500-h.p. Allis-Chalmers motor, using Sundh control. The discharge line was 16-inch. This well is one of the largest deep wells in this portion of the United States and has a capacity of 2,800 gallons per minute, or practically 4,000,000 gallons per day. The water is pulled down about 200 feet, and the efficiency while pumping 2,800 gallons per minute against a head of 85 pounds is approximately 58.5 per cent. The total cost of the complete installation was $45,000 and the pumping cost is $40 per million gallons, of which power is $30, operation $3.50, and fixed charges $6.50.

Our original estimate for furnishing an additional 3,000,000 gallons per day was $50,000, or $16,667 per million gallons. The two wells actually produce 5.75 million gallons per day at an investment cost of $65,000, or $11,300 per million gallons. The cost of pumping at the main station is $42.50 per million gallons, so that Unit Well No. 1 shows a saving of $12.50 per million gallons, and Unit Well No. 2, even with the rather excessive pull-down, shows a saving of $2.50 per million gallons.

License Fees for Street Signs

WIDE variation of current practice in the regulation of street signs is disclosed in a recent report of the New Jersey State League of Municipalities. In the report a number of typical New Jersey ordinances have been analyzed as to major requirements under the following heads:

Relation to Street, Allowed Projection over Street and Position on Buildings; Removal of Signs; Electric Features; License Fee; From Whom Secured; Amount of Fine for Violation; Inspection Required; Kind of Material.

The section covering license fees follows:

NEWARK.—For signs projecting more than 12 inches beyond building—50 cents per square foot; for other signs on buildings, 2 cents per square foot; for signs erected upon ground, 1 cent per square foot. Minimum fee, $1.

TRENTON.—No fee.

PATERSON.—Fee shall be imposed annually at 10 cents per square foot of actual surface of each sign measured on one side, but not including that portion within 18 inches of the building line. Minimum fee, $5.

PASSAIC.—10 cents per square foot of actual surface of each sign measured on one side, but not including that portion of the sign within 18 inches of the building line. Mnimum fee, $1.

EAST ORANGE.—Minimum fee, $3; over 100 square feet, $4; over 1,000 square feet, $5; for every 500 additional square feet or part thereof, $1 additional.

IRVINGTON.—50 cents per square foot of sign space or fraction thereof.

ENGLEWOOD.—No license fee.

HOBOKEN.—10 cents per square foot of sign space.

COLLINGSWOOD.—For 50 square feet or less or more than 6 square feet, 50 cents; having an area between 50 square feet and 100 square feet, $1; having an area between 100 square feet and 200 square feet, $2; having an area between 200 square feet and 300 square feet, $3; having an area between 300 square feet and 400 square feet, $4; having an area between 400 square feet and 600 square feet, $5; having an area of 600 square feet and over, $10.

BLOOMFIELD.—50 cents per square foot or part thereof.

WEST ORANGE.—General fee of $1.

TENAFLY.—General fee of $5.

DOVER.—General fee of $2.

MONTCLAIR.—General fee of $3 and a further sum of 5 cents for each and every square foot of face of said sign or other structure.

CALDWELL.—No license fee.

VINELAND.—No license fee.

Chamber of Commerce Activities in Public Affairs

Research Bureaus as a Function of Chambers of Commerce

By John B. Blandford

Secretary, Bureau of Research, Chamber of Commerce, Newark, N. J.

THE old order slowly passeth. Yesterday good citizens believed that time-worn facts broadcast from the roof-tops brought smoke-stacks to the municipal horizon. To-day a new attitude gradually reveals itself and there seems to be a substantial feeling that new industries and new citizens will seek the community borders when the conditions under which the industries must operate and the citizens must live are profitable and pleasant.

There is a realization that many of the basic needs of community life are obtained through the medium of government and that much of prosperity and happiness is dependent on its satisfactory functioning. The business man is beginning to realize more than ever that government safeguards his investment from theft and fire and protects his employees from disease and poverty; that government builds and regulates the arteries through which his commerce flows; and that government exacts a generous contribution from his earnings for such services.

Is the Chamber of Commerce a Proper Organization to Carry on Research Work?

In his paper before the recent Governmental Research Conference in Pittsburgh, from which this article has been prepared, Mr. Blandford summarized as follows his reasons for believing that municipal research work is a proper Chamber of Commerce function.

"First of all there is the very simple reason that the Chamber is an existing organization, with established financial support and with certain necessary facilities already provided. It is not, therefore, such a herculean task to launch this new work. Smaller cities may, through such a procedure, do work which they otherwise would not be able to do.

"Second, a Chamber of Commerce, historically, has always taken a vital interest in commerce and trade. With this knowledge of the basic financial condition of the community, should it not participate to some degree in determining the program of expenditures of the municipal government?

"Finally, a Chamber of Commerce is so organized that it can not only develop and interpret the facts, but it can aggressively press the resulting recommendations. In short, there are provided practical facilities, a natural interest and membership support."

General Objectives and a Program of Work

Municipal research work by the Chamber of Commerce was actually launched in 1919 when the New York Bureau of Municipal Research was retained to make a general survey of the municipal government. The report that followed was comprehensive and unique in one respect, at least, in that it included for the first time an attempt to set up a five-year budget forecast. Meritorious as the recommendations were, they were not enthusiastically or widely adopted—certainly not to the extent that they might have been if there had been immediate and aggressive follow-up. It was not until December, 1923, however, that the Chamber was in a position to establish a Bureau of Research to actively follow-up this survey.

The desirability of a simple yet comprehensive program was early sensed and it was felt that the work should be directed along

four major lines:

1. Good and ample municipal services efficiently administered
2. The physical development of the city according to a definite plan and a sound financial policy
3. The cultivation of citizen interest in government
4. The attempt to build up a national reputation for Newark as the "City of Good Government"

Ambitious? Yes, undoubtedly so. But in the Philadelphia City Club there is displayed a quotation from Daniel H. Burnham and perhaps it applies:

"Make no little plans; they have not the magic to stir men's blood and probably themselves would never be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever growing intensity."

With these general objectives established, it was not a difficult matter to translate them into a program of work. If there was to be an effort to bring municipal services up to the maximum of administrative efficiency, it was evident that all of the sound and accepted principles must be brought to bear and that the Chamber must make its contribution through an intensive ascertainment of the facts and through the presentation of definite recommendations at the municipal budget hearing and in later supplementary reports. If the city was to develop in an orderly and continuous way, it appeared essential that there be a definite physical and financial program and that the Chamber study each proposed improvement to determine its relationship to this program. If these two desirable objectives were to apply not only to the city of Newark but also to the fifteen municipalities whose interests were so intimately interwoven with those of Newark, it seemed desirable that governmental cooperation in the metropolitan area should be fostered and that the Chamber should make those studies and hold those conferences which would develop facts and reveal opinions as to the possibilities of joint action.

Finally, if each of these efforts was to be completely realized, it appeared obvious that attention must eventually turn to the structure of the local government and that the Chamber should study that. In a very practical way the first three lines of effort appeared to point up to this fourth. Satisfactory budget procedure could not be obtained unless the form of government provided an administrative official who could coordinate activities and balance out a program of expenditures. A satisfactory improvement program needed some assurance of continuity of expert administrative attention, and the progress toward regional cooperation would prosper in direct proportion as the city of Newark was able to demonstrate that it could solve its own problems in a competent and far-sighted manner.

Organization, Method and Result

To effectuate a program, a Chamber of Commerce has a mechanism made up of a number of important parts. There is the general membership body, a board of directors, a number of committees and a staff. Meetings can be called, a publication can be issued, and a mimeograph machine can be used. All of this personnel and equipment is available to develop facts, interpret them and place them before the community. Chamber members can be interested and their support obtained through service on committees, membership forum meetings, and the monthly publication. City officials can be cooperated with through committee reports, committee conferences and special letters. The citizen body can be interested through group conferences, speakers, and newspaper and radio publicity. Other civic organizations interested in the same problems can be stimulated to similar and supporting action through being informed of the Chamber's activities.

Basically, the committees, through the authorization of the Board of Directors, hold the key to the situation. While the study work is done by the staff, the wheels do not begin to turn over until the material is placed before a committee. Special attention has therefore centered on a plan of committee organization. For the work in the field of government it has appeared desirable to group the municipal activities into six major divisions and assign each division to a committee. Under this plan there is a committee on form of municipal government and other committees on public finance, public works, public welfare, education, and county government. During the year each of these committees makes such studies as time will permit of the activities assigned to it. When the municipal budget-making time rolls around, each committee gives special attention to the budget divisions which relate to its assigned activities. When the budget studies are completed, the results go forward to a joint budget committee, composed of the chairman and vice-chairman of each of the six committees, and they are re-

viewed and consolidated into the final Chamber budget statement.

As illustrative of the nature and scope of these studies, the 1925 Chamber budget statement is perhaps representative. The steps leading up to its presentation were the customary ones. The staff went out into the municipal departments and got the facts, ascertained the best practice, and prepared reports with recommendations. The various committees then functioned in the manner that has been indicated. The budget report carried the following major comments:

Attention was called to the variation existing between the city's distribution of health expenditures and the generally approved percentage distribution, and it was recommended that consideration be given to the relative health productive value of the various activities.

Concern was expressed over the great increase in free hospital beds and it was recommended that admissions be more carefully controlled and that the possibility of part-pay service be studied.

A bureau of public welfare with trained social workers was recommended to replace the present system of dispensing relief.

The cost of cleaning public buildings was shown as excessive.

The trailer system of refuse collection was recommended for trial.

Two additional motor flushers were proposed.

Accepted standards of company strength for fire department apparatus were reviewed and certain reductions in personnel recommended.

Major reorganization steps were recommended for the police department.

Centralized purchasing was again urged upon the commission.

These recommendations were of necessity presented in summarized form, but the report carried a comment that each recommendation would be amplified in detail in subsequent reports. This promise is being kept. Each time such a supplementary report has been prepared, the results have been forwarded to the public official and to the newspapers at the same time. This procedure has seemed justified because each recommendation has been already before the citizen body and officialdom at the time of the previous budget hearing, and, moreover, the respective officials are constantly in touch with the staff while the supplementary research work is being done. In nearly every instance this newspaper publicity has resulted in editorial comment and the Chamber has had an opportunity to reiterate and amplify its views in a reply to the editorial. After the official has had an opportunity to study the report, the committee requests a conference and in this way attempts to communicate its views in a more personal way and likewise obtain the reactions of the department head. According to the results of this conference the committee commends the department head for his acceptance of the recommendations or through further publicity in the shape of newspaper articles, pamphlets and addresses presses its recommendations. Publicity is receiving special attention.

Council-Manager Plan of Municipal Government Proposed

The action of the Chamber on the question of form of municipal government will also serve to illustrate the procedure that has been followed. The occasion for the study developed when a citizen group attempted to bring about a return from the present commission form to the discarded aldermanic plan. The Board of Directors of the Chamber interpreted this move as a backward step and instructed the committee on municipal government to study the situation and recommend appropriate action. The conclusions of the committee were, of course, adverse to the proposed change. Emphasis was added to this report when the Director of the New York Bureau of Municipal Research at a subsequent membership meeting disposed of the aldermanic form in a most satisfactory way. The movement to return to the old form failed. However, the committee's study left disturbing after-thoughts. The recommendation that it had made was in a sense negative. Why not do a good job and offer something positive and constructive? There was an opportunity for this, for, in opposing the return to the aldermanic plan, the defendants of the commission form, had conceded that there were defects which, however, could be corrected through minor modifications rather than a return to the old plan.

This admission of defects was a happy point of departure, and so the committee went into its study and developed through all available sources information on different forms of government. As a background for the report and as a medium of arousing general interest in the conclusions, three membership meetings were held and one form of government discussed at each. Finally came the committee report with the recommendation that the council-manager plan be the objective of the next effort to improve the form of government in Newark. This recommendation with a report presenting the advantages and disadvantages of all important forms was sent to each Chamber member together with a ballot. The results of this membership referendum were conclusive. The council-man-

ager plan was approved by a vote of 948 to 186. With this mandate from the members, the Board of Directors has authorized a campaign of education and this is now actively under way under the general sponsorship of the committee on form of municipal government.

These two major activities—the budget study and the work on form of government—indicate in a general way the functioning of the Chamber through the medium of staff, committee, Board of Directors, membership, and publicity. As for results, who can satisfactorily estimate them? Certainly, there are no illusions as to possibility of immediate and enthusiastic acceptance of every proposal that is ventured. There is a full realization that in work of this nature the geologist's time units are especially applicable. As for the work on the budget, some few of the less important recommendations have been accepted and on some of the more important ones an expression has been obtained that favorable action might result if supporting public opinion could be developed. The preventive effect of knowing that extravagant and unwise expenditures will be subject to review cannot, of course, be estimated. As for the work in support of a change in form of government, there seems to be evidence of real progress. A little over a year ago in Newark the council-manager plan was either not known about or an unwelcome subject of conversation. To-day comments by business men on the working of the present commission form are frequently followed by a statement that the "business manager" plan is the only way out. Certainly, the fact that the Chamber, once cold to the plan but now taking on a staff member to devote his complete time to advocating the plan, is evidence of a new attitude. To sum up, it can be safely stated that the Newark Chamber is becoming increasingly active and aggressive in governmental affairs and that the citizen body generally is becoming more interested.

Effectiveness of the Committee Method

Actual contact with the committee method of functioning seems to indicate certain very desirable features. The committee personnel is to no small degree representative of important community interests, and to the extent that it is, its reports are subjected to a typical citizen reaction. Ill-advised and untimely proposals may receive very desirable modification —not so much in fact or conclusion, but rather in emphasis and manner of presentation. Again, the study and discussion of reports by committees has a definite educational value in that it informs a small citizen group, at least, of the details of various civic projects. Moreover, the approval of reports by committee members adds an element of support and makes the whole procedure more personal—both of which enhance the publicity value of the action.

There is one principle that the Chamber committees have agreed upon and it seems sound. They have discarded and discredited the old idea of round table exchange of personal opinions without basis of fact. On questions where the staff was equipped to develop the facts, specific recommendation has been offered. Where the problem required extensive research and special knowledge, the contribution of the committee has been limited to outlining the scope of the problem and urging that officials through the retention of experts undertake the development of facts. This policy has been pursued in recommending surveys of the all-year school system and of certain features of the traffic, transit and transportation problem. The committees have been most careful in insisting that final responsibility of decision is one that the elected officials must assume and most careful in avoiding any action which would confuse this responsibility.

A National Trend

The significant aspect of this chamber work in the field of government is its increasing national extent. Many other chambers can be credited with action which has preceded that in Newark. In the Chambers of Commerce of Minneapolis and Hoboken there are bureaus of municipal research. In Indianapolis, Cincinnati, and Kansas City there are very active civic departments. The Chamber of Commerce in El Paso has a Tax and Economy Department and in Oklahoma City there is a Research Department. Many chambers have a committee on municipal affairs. All chambers have from time to time taken action on such questions as city planning, zoning, education, water-supply, traffic, and many other municipal activties.

Chamber of Commerce activity in the field of governmental affairs is destined to expand. As it does expand, so will it improve in quality as well as quantity; so will it progress from committee resolutions based on limited knowledge to comprehensive reports based on complete facts developed by chamber bureaus of governmental research.

Recommendations and Achievements of Civic-Commercial Organizations

Flood Storage Lakes in Oklahoma

OKLAHOMA CITY.—In 1923 the entire valley of the North Canadian River, running east and west through the state of Oklahoma, suffered a tremendous flood loss, reaching into the millions. Farms, buildings, bridges, railroads, and highways were wrecked and ruined. As Oklahoma City is located in this valley, the Oklahoma City Chamber of Commerce at once set to work with a group of lawyers, engineers, and business men to prevent repetition. The lawyers and legislators were set to work to enact adequate drainage laws. The United States Government engineers were called in; geologists and engineers were drafted and surveys made and levels taken, and a great and peculiar physical fact was brought to the public notice.

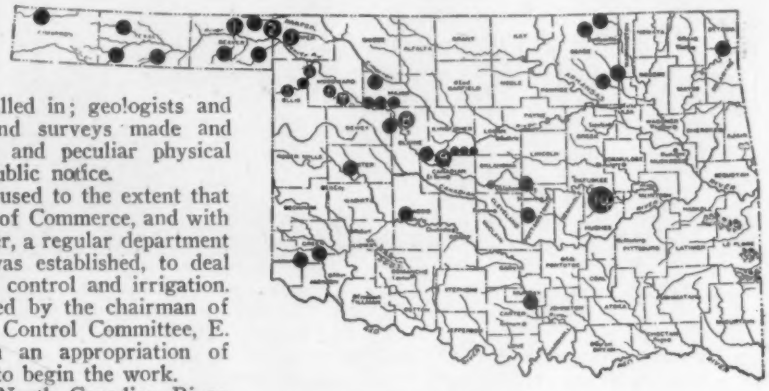
Public sentiment was aroused to the extent that through the local Chamber of Commerce, and with the aid of the State Chamber, a regular department of the state government was established, to deal with the problems of flood control and irrigation. This department was headed by the chairman of the local Chamber's Flood Control Committee, E. E. Blake, and was given an appropriation of $50,000 a year with which to begin the work.

It was found that the North Canadian River, having its origin far out in the sunken craters of New Mexico and Colorado, and running through the higher altitudes of the West, carries a high elevation far into Oklahoma. Through much of its course the river runs upon an elevated ridge of only ten to sixteen miles in width. This ridge carries the water at a height of about 200 feet above the large parallel rivers on the north and south. It was found also that numerous large basins lie upon this ridge adjacent to the watercourse, and that, with small expense, short canals cutting through the banks would carry the water into these great natural basins to form enormous lakes.

To have a basis of operation, it was necessary to survey and diagram the river course through some eighteen counties, a distance of 450 miles. The Chamber of Commerce of Oklahoma City at once took up the task of raising funds for this survey, and the survey was executed. In Oklahoma City $25,000 was raised for this purpose, and since that time the eighteen counties along the course have contributed to this work. About 27 of these large basins have been located and surveyed west of Oklahoma City. They range from 2,000 to 13,000 acres in extent and will cover an area of about 59,000 acres. Their altitude is such that adjacent lands, about 300,000 acres in extent, will be subject to irrigation, and the use and sale of water to this land promises large development. East of the city, the proposed basins will cover about 200,000 acres, and are expected to aid definitely in the flood prevention in that section.

A complete code of drainage laws was enacted, authorizing the incorporation of flood control districts organized as corporate bodies with power to make surveys, levy assessments, exercise the right of eminent domain, issue bonds, and carry on these large improvement works on an extensive scale.

Petitions are now being circulated for the incorporation and organization of a drainage district along the course of the North Canadian nearly two-thirds of the distance across the state, and passing through or affecting some eighteen counties. The formation of this district, affecting as it does some 850,000 acres of land heretofore subjected to disastrous floods and the impounding of these great volumes of water, is easily one of the greatest industrial enterprises of the Southwest. Its promotion and operation is a gigantic enterprise that is being watched with keen interest.



TENTATIVE LOCATIONS OF SOME OF THE STORAGE LAKES IN OKLAHOMA

There are other great rivers in this new state of the Southwest that, like the North Canadian, rise far up into the altitudes of New Mexico and Colorado, and at every season carry a tremendous wealth of water and damage eastward toward the Mississippi. The industrial and agricultural value to be obtained once these great floods are tamed and subjugated to man's will, is beyond all estimate.

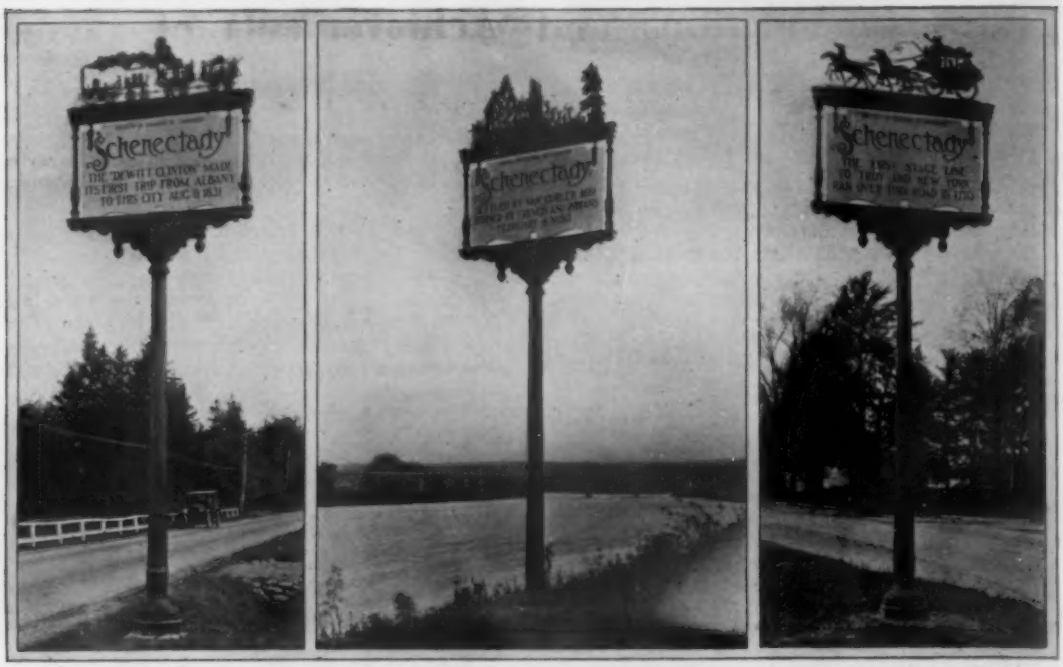
The Oklahoma City Chamber of Commerce counts this work as a magnificent contribution to public interest.

STANLEY C. DRAPER,
Assistant Manager, Oklahoma City Chamber of Commerce.

History and Art in Schenectady Signs

SCHENECTADY, N. Y.—Three artistic road signs portraying important episodes in the early history of Schenectady were recently erected by the local Chamber of Commerce at the three principal entrances to the city. The subjects of the signs were developed with historical accuracy, and the designs were drawn by Captain J. W. Gosling, Decorative Designer of the General Electric Company, a member of the Chamber's Advertising Committee.

On the Albany road stands the sign surmounted with a silhouette representing the DeWitt Clinton, the historic passenger train that made its



ROAD SIGNS ERECTED BY THE SCHENECTADY CHAMBER OF COMMERCE. IMPORTANT EPISODES IN THE EARLY HISTORY OF THE CITY ARE ARTISTICALLY PORTRAYED

first trip from Albany to Schenectady in 1831. The train has been preserved by the New York Central Railroad Company and is on exhibition on the balcony of the Grand Central Station, New York.

The sign placed at the approach to the new Great Western Gateway Bridge, entering the city from the west, at a point adjacent to the new Hotel Van Curler, depicts the burning of the city by the French and Indians in 1690, and gives the additional information that this community was settled in 1661 by Van Curler. This latter statement will serve to answer the question as to the origin of the name of the new hotel that will probably arise in the minds of many tourists stopping here.

The third sign, erected on the Troy road, bears an artistic silhouette of a stage-coach with passengers, drawn by four spirited horses, and states the fact that the first stage to Troy and New York ran over this road in 1793.

The Advertising Committee of the Chamber, to which the credit for the erection of these signs should be given, is enthusiastic about the value of this piece of work to the city. It is believed that the unique character of the signs and their beauty of design will attract attention and will help to create a lasting favorable impression of the city among our visitors.

B. H. BONNAR,
Secretary, Schenectady Chamber of Commerce.

Traffic and City Planning Commission Proposed for New York

NEW YORK.—Believing that street traffic congestion is one of the most vitally important problems now facing the city of New York, the Fifth Avenue Association is urging the incoming city administration to appoint an official Traffic and City Planning Commission with personnel and finances adequate for the preparation of a comprehensive plan of traffic relief. In a statement on this subject issued December 7, 1925, the Association said in part:

"Close association with the problem and participation in efforts to secure relief have convinced us that vehicular movement is rapidly getting beyond the power of reasonable police control. We believe that the day is approaching when, unless definitely planned steps are taken to provide more roadways for vehicular accommodation, traffic will so congest our streets as to render regulation impossible, hampering the conduct of business and endangering the health of the community.

"The pressing nature of existing conditions is reflected not only in general inconvenience, but also in substantial losses suffered by local industry and by the public. Traffic delays increase manufacturing and delivery costs, cause accidents and decrease property values.

"This condition is alarming enough when it is viewed as a step in the direction of vehicular stagnation and as a tax upon the productivity and living conditions of the general public. It is doubly serious in the face of the threat it entails against the commercial and industrial progress of our city. It has been stated that already many industrial establishments have moved to other cities where their business can be more efficiently and more economically conducted. Whether this report be accurate or not, it is axiomatic that business and manufacturing in the city of New York cannot hope to successfully compete, under such a handicap, with similar industries conducted in other cities under more favorable transportation conditions.

"The present situation, however, is not a police

problem. The duty of the Police Department begins and ends with the best possible regulation of traffic commensurate with business and public needs and within the limitation of such facilities as are placed at their command. Neither is the problem one for solution by the means of disassociated and local plans, no matter how excellent they may be. The problem is one of major importance, city-wide in its effect, and it must be city-wide in its solution.

"The city of New York owes itself the obligation of pausing at this time to take stock of its traffic facilities and its traffic requirements. It must develop a definite comprehensive plan for the future; otherwise, there can be no relief of a permanent nature. The preparation and effectuation of such a plan requires consideration and study by a commission of competent men; engineers and executives of the most able type. It requires, above all, that this commission be composed of engineers and business men able to devote their time to the consideration of these problems, and that the commission be provided with sufficient funds for the purpose of effecting a working organization, including the employment of engineers and other necessary help on such a basis that the technical staff shall devote their entire time and effort to the assembling of data and the working out of details."

The undersigned will be glad to send an outline of the activities suggested for the proposed Traffic and City Planning Commission, to any civic-commercial organization interested in problems of traffic relief.

WILLIAM J. PEDRICK,
Vice-President and General Manager, The Fifth Avenue Association.

Spectacular Parade Helps Community Chest

PORTSMOUTH, VA.—One of the most spectacular and attention-compelling parades ever held in this city was that engineered by a committee of the local Chamber of Commerce at the opening of Portsmouth's recent community chest campaign. The purpose of the parade was to bring before the people as impressively as possible the work being done by the institutions within the community chest, and it is believed that this was one of the most influential features of the drive, which resulted in pledges amounting to considerably more than the established goal of $72,500.

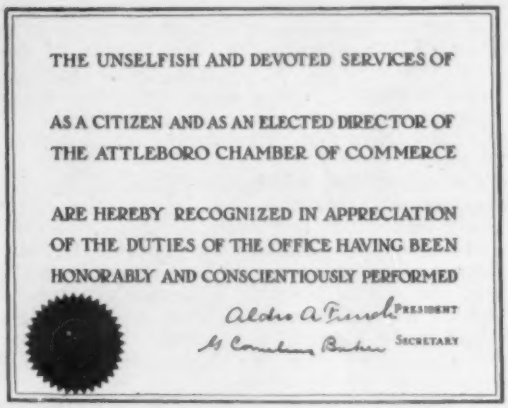
All the charitable organizations within the community chest were represented in the parade by floats, many of which were elaborately and artistically decorated. The City Administration, Retail Merchants Association, City Mission, Department of Public Welfare, Rotary Club, Kiwanis Club, and Chamber of Commerce were also represented by floats expressing their endorsement and support of the movement. The Chamber made use of one of the Fire Department trucks, appropriately decorated, and on this was mounted an electric organ played during the parade by two capable musicians. In line with the floats were a band of the United States Navy, a troop of Boy Scouts on bicycles, motor-cycle police officers, and many people on foot carrying banners outlining the activities of the various institutions.

While the parade followed its route through the principal business and residential sections of the city, church bells and the sirens, bells and gongs at the city's many fire-stations announced the opening of the community chest drive.

GEORGE H. CLESS, JR.,
Executive Secretary, Portsmouth Chamber of Commerce.

A Testimonial for Civic Service

ATTLEBORO, MASS.—One of the ways in which the Attleboro Chamber of Commerce expresses its recognition of services rendered by the members of its Board of Directors is to present to each retiring director, at the Chamber's annual


THE UNSELFISH AND DEVOTED SERVICES OF
AS A CITIZEN AND AS AN ELECTED DIRECTOR OF
THE ATTLEBORO CHAMBER OF COMMERCE
ARE HEREBY RECOGNIZED IN APPRECIATION
OF THE DUTIES OF THE OFFICE HAVING BEEN
HONORABLY AND CONSCIENTIOUSLY PERFORMED
PRESIDENT
SECRETARY

meeting, a certificate bearing the message which may be read in the accompanying reproduction. These tokens of appreciation have been received with much pleasure by our past directors.

Because we believe the idea to be an excellent one, we are glad to pass it on to other organizations.

G. CORNELIUS BAKER,
Secretary, Attleboro Chamber of Commerce.

Canton Adopts Smoke Abatement Ordinance

CANTON, OHIO.—A modern and comprehensive smoke abatement ordinance was recently passed by the City Council of Canton, thus terminating successfully long efforts on the part of the Canton Chamber of Commerce toward this end.

While the present ordinance covers only the business district of the city, W. T. Kuhns, President of the Canton Chamber, declares that it is a big step in the right direction and that eventually the ordinance will be broadened. The Chamber of Commerce studied the smoke abatement problem for a number of years, finally drafted the legislation, submitted it to the City Council and urged its passage.

Smoke density will be judged under the Ringelman smoke chart, prepared by the Federal Bureau of Mines. No dense smoke will be permitted to issue from a smoke-stack, chimney, open fire, tar kettle, steam shovel, or any fuel-burning machine for a period of over six minutes in one hour. The only exceptions to this clause are dwellings housing less than four families, and fire department apparatus.

The ordinance provides for a Smoke Abatement Commission of five members, a chief smoke inspector, and deputies if necessary. The chief inspector is to report all violations of the ordinance to the Commission. The Commission will authorize warning of violators. If abatement

does not follow within twenty-four hours, prosecution is to follow. The ordinance provides for a fine of not less than $10 nor more than $100.

The new legislation also requires that all new heating plants and furnaces being or to be installed in buildings coming under the restrictions must be inspected by the smoke inspector and approved before they are operated.

DALLAS L. HOSTETLER,
Assistant Manager, Canton Chamber of Commerce.

A Community Banquet

PERU, IND.—One of the most representative community gatherings ever witnessed in Peru was that which assembled at the recent banquet in honor of Vic Aldridge, the hero pitcher of the Pittsburgh nine in the World Series baseball games this year. The program was participated in by representatives of all the various creeds and political parties that make up the citizenship of the city.

The celebration, which was sponsored by the Chamber of Commerce, was held in the High School auditorium, and through the generosity of local merchants in donating the food for the banquet, a profit of $259 was realized on the proceeds from the sale of tickets. This sum was turned over to the Athletic Association of the High School to be applied as a payment on the ten-acre athletic field that has been acquired by the student body of the school.

F. B. LAMSON,
Secretary, Peru Chamber of Commerce.

Chambers of Commerce Help Gather Data for Census of Manufactures

The Bureau of the Census is making plans for the next biennial census of manufactures, which will cover the year 1925, as provided in the Act of Congress approved March 3, 1919.

In deciding upon the items to be covered by the census, the Bureau has consulted with the representatives of various manufacturers' associations with a view to securing, as far as practicable and without making the schedule too elaborate, information which will be of value to the representatives of the several industries concerned, and at the same time furnish a record of the progress of manufactures generally throughout the United States.

The blank forms upon which reports should be made will be mailed by the Bureau to all manufacturers about January 1, and a report will be required from each manufacturer whose gross products are valued at $5.000 or more for the year 1925. In requesting the aid of THE AMERICAN CITY in connection with this census, W. M. Steuart, Director of the Bureau of the Census, writes that practically all the trade associations and chambers of commerce in the United States are cooperating in gathering the necessary data. It is hoped that all manufacturers will furnish the information desired, soon after January 1, in order that there may be available as early as possible in 1926, the statistics which will show the condition and record of their industry for 1925.

Pittsburgh's Graded Tax Plan in Full Operation

IN the *National Municipal Review* for December, 1925, there is published an important discussion by Percy R. Williams, member of the Pittsburgh Board of Assessors, of the working of the Pittsburgh graded tax plan, the purpose of which is to encourage business and improvements and to discourage land speculation by decreasing taxes on buildings and increasing taxes on unimproved land. Readers of THE AMERICAN CITY are familiar with this plan of taxation as outlined briefly in the issues of October, 1922, page 324, and October, 1924, page 389. Mr. Williams' article covers a much more comprehensive analysis of the evolution and effects of the graded tax, and concludes with the following analysis of the present status of the plan:

"The expediency of the graded tax plan lies in the fact that it means tax relief for the majority of taxpayers and that it encourages the improvement of real estate, thus stimulating the development of the community. The justice of the graded tax plan rests upon the fact that land values are socially created, growing with the growth of population and the extension of public improvements, and are therefore, in a peculiar sense, a natural and logical source of public revenue.

"Naturally, the graded tax has not been without opposition. It has been fought by those largely interested in unimproved land, as well as by some who are opposed to the plan in principle. Its repeal has been attempted on several occasions, but its friends have rallied on each occasion and frustrated these efforts. It has been defended by the leading civic organizations and the daily press is practically unanimous in declaring for the maintenance of the law upon the statutes.

"The present city administration, which is friendly to the graded tax idea, is not proposing at this time any further extension of it beyond the limits of the present act, but takes the attitude that now that the law has become fully effective, the plan should be given a period of five or ten years in which to fully demonstrate its value. When the taxpayers generally awaken to the realization that the repeal of the law would mean a substantial increase in taxes for the great majority of real estate owners, they are sure to present effective resistance against any future efforts to upset the system. As the graded tax grows in public favor, it seems unlikely that there will be any backward step, and there are even now indications that, within a few years, steps may be taken by interested citizens to extend the partial exemption of improvements beyond the present point through new legislation. Whether or not this will actually be brought about is, of course, largely a question of the development of public opinion as to the advantages of the improvement exemption idea."

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

THE aggregate of municipal bond sales for the month of December will be well over $135,000,000. This amount is more than double the November figure, which was $65,000,000. This increase is evidenced in the list of offerings for the month. The city of Philadelphia sold $23,900,000, and the School District $5,000,000. The state of North Carolina was in the market and disposed of $20,125,000, and the cities of Los Angeles and Detroit disposed of blocks of $14,825,000 and $13,410,000, respectively. When final figures for the entire year are available, the 1925 total of state and municipal bond sales will show a decrease of at least $60,000,000 in comparison with 1924. The state issues fell off in 1925 to the extent of $85,000,000. It would seem as though the difference in the aggregate would be due directly to this decrease in state financing, offset to the extent of $25,000,000 by an increase in municipal issues (cities, counties, towns, districts, etc.). However, when it is recalled that the city of New York sold $60,000,000 last May, whereas that city did not issue any bonds in 1924, it appears that except for New York City, municipal issues fell off to the extent of at least $35,000,000 during 1925.

Glancing back over the year, we conclude that the municipalities which borrowed in the 1925 market paid less for the funds borrowed than they have for several years. During last May and June higher prices were being paid for issues than at any time since 1917. The New York City sale referred to above was made at the best price in nine years. As the year progressed, however, interest rates increased slightly.

The following list of sales is offered as a guide to the December prices:

Amount	Municipality	Maturity	Rate (%)	Net Yield (%)
$3,925,000	Boston, Mass.	1926-45	4-4¼	4.12
2,500,000	Providence, R. I.	1926-46	4	4.20
2,170,000	New Rochelle, N. Y.	1928-60	4½	4.23
625,000	Chicago, Ill.	1928-40	4	4.24
3,600,000	Newark, N. J.	1926-65	4¼	4.24
500,000	Erie, Pa.	1931-55	4¼	4.25
366,000	Mt. Vernon, N. Y.	1927-45	4½	4.25
13,410,000	Detroit, Mich.	1926-55	4-4½	4.31
5,000,000	Chicago, Ill., Sanitary Dist.	1926-45	4	4.32
926,000	Bergen Co., N. J.	1926-44	4½	4.33
23,900,000	Philadelphia, Pa.	1975/45	4½	4.36
360,000	Toledo, O.	1927-31	4½	4.36
5,000,000	Philadelphia, Pa., Sch. Dist.	1936-55	4½	4.38
350,000	Toledo, O.	1927-51	4½	4.39
136,000	Toledo, O.	1927-36	4½	4.43
1,000,000	Multnomah Co., Ore., Sch. Dist. No. 1.	1928-45	4½	4.48
20,125,000	North Carolina	1930-66	4½	4.49
785,000	Memphis, Tenn.	1926-52	4-4¼ & 4¼	4.57
937,000	Birmingham, Ala.	1949-54	4¼	4.59
14,825,000	Los Angeles, Cal.	1926-65	4½ & 4¼	4.62
2,175,000	Houston, Tex.	1926-51	5	4.68
649,000	Pennsauken Tp., N. J., Sch. Dist.	1926-65	4¼	4.73
1,885,000	West Palm Beach, Fla.	1926-55	5	5.11
470,000	Orlando, Fla.	1926-35	5	5.58

Better Building Construction One of the Most Effective Ways to Fight Fire

ONE of the most important ways in which our tremendous annual fire loss (which now exceeds 500 million dollars) can be reduced is through better building construction, says S. H. Ingber, Chief of the Fire Resistance Section of the Bureau of Standards, Department of Commerce. While this method of reducing fire losses necessarily takes some time in yielding apparent results, it is nevertheless one of the most effective ways of combating this destructive element in the long run. It is to be hoped that as old buildings are replaced, and as the new construction reflects to an increasing extent the knowledge gained in the laboratory and through studies of actual fires, the destruction of property will decrease.

The Bureau of Standards is carrying out many investigations with the object of improving the fire resistance of building materials and construction. Tests are being made on full-sized columns, walls, and partitions, using specially designed furnaces in which the temperatures encountered in a burning building can be duplicated. In this way the behavior of different kinds of construction and the value of all the commonly used building materials can be studied under accurately controlled conditions.

In order to find exactly what temperatures are reached in a burning building and how long a given temperature is maintained, the Bureau has constructed a special fire test house in which actual fires are "staged" from time to time. This small building is fitted up with discarded furniture and supplies, to stimulate any desired occupancy, and is then set on fire and the necessary data secured. From the results of this work it has been possible to state just what temperatures ought to be in the experimental furnaces.

Other tests have covered roofing materials, theater curtains, and office furnishings, such as filing cabinets and safes. In the case of safes the fire test is followed by a drop test to stimulate the rough treatment which a safe receives when the floor of the building collapses. If the safe withstands the drop test, it is heated again in the furnace, as would be the case if it had fallen into the basement and was surrounded by burning material.

While these tests may seem destructive on first consideration, they are in reality one of the most constructive lines of work now in progress at the Bureau.

Coldwell Model "L" Motor Lawn Mower and Roller, showing Detachable Gang Units

This Coldwell Model "L"

Mows and Rolls Simultaneously

Better Results—Lower Upkeep

The beauty of the grounds in parks or those around public buildings depend largely upon the way in which the lawns are kept. To have lawns that are even, well cut, and as "smooth as velvet", they should be rolled as they are mowed.

The Model "L" Motor Lawn Mower and Roller is the correct type of power mower for this work. Equipped with a full width drive roller, it mows and rolls simultaneously, thereby giving that gentle rolling with each cutting which is quite necessary to grass health as well as to give that even surface.

These "two operations in one" save just one half in time, labor and expense. Under ordinary conditions one Model "L" will complete 4 to 6 acres a day on a gallon of gasoline. With the new detachable gang units, which increase the swath from 25 to 60 inches, the Model "L" will mow 10 acres a day. Simple to operate, efficient and dependable in every respect, it's a real mower for municipalities.

Coldwell makes a hand, horse or motor mower for every type of lawn. Complete catalogues and detailed information will be sent upon request

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When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

Ultimately, the Regional City

Chicago's Vision of the "Future Metropolis of the World"

By Jacob L. Crane, Jr.

THE future metropolis of the world is destined to be here at Chicago, but if the Regional Plan is carried out, this metropolis will be a Regional City instead of an overgrown, inefficient and stagnating single city. This Regional City will be made up of two hundred or more smaller and middle-sized industrial and residential cities in the Chicago region, all closely interconnected with transportation and communication facilities, and with Chicago itself as the banking, business-administrative, and cultural center. The smaller cities will range in population from 25,000 to 250,000; each will have its own local government; and each will take part in a co-ordinated regional authority for carrying out public improvements in which the entire Regional City is interested. This Regional City of from six to ten million people distributed in a large number of interrelated communities, and with vast agricultural and recreational open spaces between them, is pictured in contrast to the over-concentrated type of city, like Chicago, which grows by accretions, each one of which adds to the physical difficulties, instead of throwing off the interrelated and more or less dependent regional sub-city.

The Over-concentrated City Fails in Its Purpose

A city like Chicago is in many ways a tremendously successful machine for carrying on industry and commerce, but with too large a growth in a single center disadvantages develop which tend to nullify the advantages of concentration. Some of the points in which the over-concentrated city begins to fail in its purpose are:

The failure of the street system to handle expeditiously the rapidly mounting volume of street traffic;

The significant increase in the respiratory diseases resulting from dark, smoky air and crowding of people, and in heart disease resulting from over-exercise and over-excitement;

The enormous loss of time and energy to the factory and office worker who must lose from one to two or even three hours a day going back and forth from his home to his work;

The enormous waste of the haphazard development which results in blighted districts, loss of property values and the necessity of replacing buildings and improvements long before the end of their physical life; and

The disagreeable conditions caused by noise, dirt and confusion.

These defects in the city are all dependent directly or indirectly upon overcrowding, and the defects multiply geometrically with the increase of population and the extension of the city itself.

It is these defects in the solidly built-up city which have set the forces of decentralization at work, which in turn will ultimately produce the Regional City. The Regional Plan has as its purpose the establishment of the main outlines for the physical development to eventually serve this Regional City. The organization and accomplishment of the Regional Planning Association, particularly during the last year, are cause for great encouragement and assurance of success.

Factors in the Development of the Chicago Region

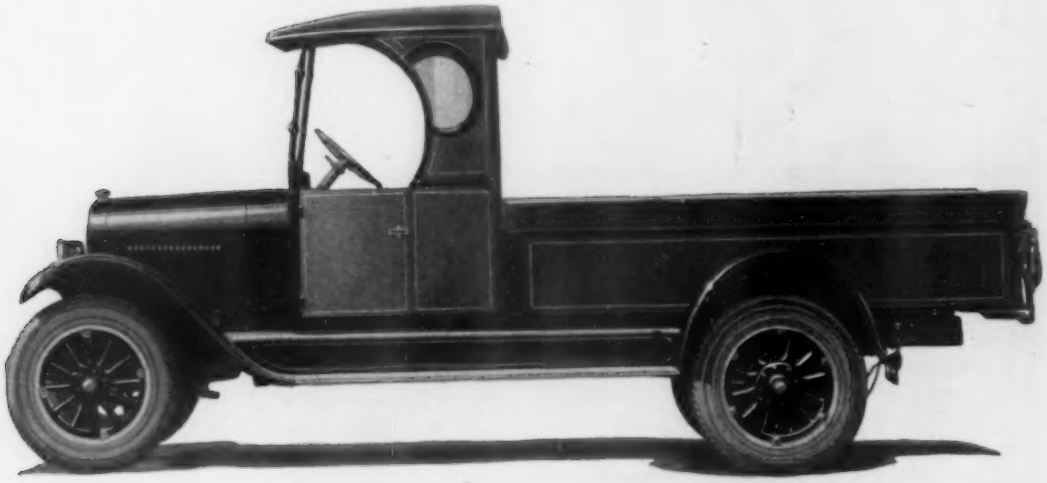
The many special factors of the Regional City include the development of the Fox River Valley with navigation and water-power on the river, and a highly organized, electrically operated industrial life. The great steel district is destined to grow and to acquire a large residential suburban development of its own, radiating round such points as LaPorte and Valparaiso, Ind. There will be a large increase in transportation facilities by rail and particularly by motor busses, both in suburban and in what might be called intersuburban travel. There will be important harbor developments, closely related to the rail and highway facilities, to handle the industrial products of the entire region. Ultimately there will be from 100,000 to 200,000 acres of forest preserves, including an outer belt approximately thirty miles out from Chicago. The lake front will be a park, almost continuous from the Wisconsin state line to the Michigan state line. The delivery of high-tension electric power by a super-power system over the entire region will stimulate industrial centers. Areas will be set aside and zoned to protect them for residential use and for garden cities and garden suburbs.

—Summary of an address delivered on December 8, 1925, at the annual banquet of the Chicago Regional Planning Association.

THE AMERICAN CITY

CHEVROLET

for Economical Transportation



The Chevrolet 1-Ton Truck with Open Express Body

Sturdiness and Fine Appearance at Low Cost

Designed especially for commercial service, this sturdy Chevrolet truck chassis is built with oversize rear axle and with wheels, frame and springs of heavy construction, with strength in all units to stand up under severe usage.

Finely built bodies to fit this chassis carry back the clean lines of the Chevrolet hood to present a very attractive appearance. Running boards, front and rear fenders and electric headlights complete the favorable impression these trucks make and are included in the price of the chassis.

Its low price and small operating cost make it remarkably economical.

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Planning Problems of Town, City and Region.—Papers and Discussions at the International City and Regional Planning Conference, held in New York April 20-25, 1925. 530 pp. Illustrated. Apply to National Conference on City Planning, 130 East 22d Street, New York. $3.00.

Important and up-to-date material on all the phases of city and regional planning and zoning, presented by national and international authorities. An essential volume for the library of any student of the subject.

Proportional Representation.—Compiled by Lamar T. Beman, A.M., LL.B., Attorney at Law, Cleveland, Ohio. Volume III, Number 5. of The Reference Shelf. published by The H. W. Wilson Company, New York. 1925. 149 pp. 90 cents.

This is a debaters' handbook and follows the general plan of its series. The question considered is: Resolved, that the Hare system of proportional representation (the single transferable ballot) should be adopted as the method of electing the members of all legislative bodies. Briefs for both sides are given, a selected bibliography, and articles selected as impartially as the material will permit.

Working Manual of Civics.—By Milton Conover, Assistant Professor of Political Science in Yale University. The Johns Hopkins Press, Baltimore, Md. 1925. VII+88 pp. 75 cents.

A book of exercises to supplement the ordinary textbooks on civics as used in high and normal schools, junior colleges, university extension courses, and private study clubs. They bring the student in touch with the actual workings of national, state and local government, and may be adjusted to suit communities of different library facilities. The manual embodies the project method applied to the socialized recitation.

Niagara In Politics.—By James Mavor, Emeritus Professor of Political Economy in the University of Toronto. E. P. Dutton & Company, New York. 1925. VI+ 255 pp. $2.00.

A critical account of the Ontario Hydro-Electric Commission. The author believes that government operation of public utilities is dangerous and destructive, and has written this book to prove that the Commission has endeavored to make itself an absolute monopoly in order to keep a small number of politicians in power. He maintains that through this undertaking the Province has been financially embarrassed. His purpose is to refute the statements of Carl D. Thompson in the latter's "Public Ownership," a volume which presents the Ontario Hydro-Electric as "the most striking and significant example of public ownership in the electrical field."

Planning School Buildings.—Report of Committee on School House Planning, of the National Education Association (Frank Irving Cooper, Chairman). 1925. 164 pp. Charts. Architects, educators, school boards, and superintendents have given aid to the Committee in various phases of the preparation of this report. The Table of Contents gives a clear idea of its importance: The Process of Planning and Constructing a School Building; Determination of the Schedule of Rooms; Choice of the General Plan; Capacity of Instruction Rooms; Capacity of Library and Study Halls; Detecting Waste in the Plan; State Regulations; Illumination; Safety to Life; Specifications; Estimating the Cost of a Building; Planning Gymnasiums and Their Accessories for Junior and Senior High Schools. $1.00. (Apply to the Association, 1201 Sixteenth Street, Washington, D. C.)

Planning a Public Junior College.—In the November, 1925, issue of the *American Educational Digest*, 1126 Q Street, Lincoln, Nebr. Report of a study organized and presented by Dr. F. P. O'Brien, of the University of Kansas, for the city of Hutchinson, Kans., pertaining to the proposed development of a junior college to be maintained by that city. Definite standards are proposed and an outline of procedure is given. 85 cents. (Apply to the publication.)

Municipal Budget-Making.—By R. Emmett Taylor, A.M., LL.M., Associate Professor of Business Law and Accounting, University of Cincinnati. The University of Chicago Press, Chicago. 1925. XIII+233 pp. $2.50.

This is a study of the actual procedure in budget-making in municipalities of various sizes and various forms of government. It comes to the taxpayer and the student as well as to the city administrator with information which helps to establish an intelligent basis for action in progress toward municipal thrift. An accountable administrative organization, a system of accounts for holding the organization accountable, and a budget representing future accounts for which the organization will be held responsible—these are the elements of an effective system of control of municipal revenues and expenditures. The author has incorporated in this volume all the recent changes in municipal budget-making in the United States.

Health Through Prevention and Control of Diseases.—By Thomas D. Wood, M.D., College Physician and Adviser in Health Education, Teachers College, Columbia University; and Hugh Grant Rowell, M.D., Physician, Horace Mann Schools, Teachers College, formerly Director of Health, School Department, New Bedford, Mass. World Book Company, Yonkers-on-Hudson, N. Y. 1925. VI+122 pp. $1.00.

Practical information for teachers, school officials, physicians and nurses, and parents, as to the diagnosis and treatment of communicable diseases among school children, in order to make the school a health center. The instruction given is so definite as to make this a handbook for those responsible for health maintenance in the schools.

Small House Designs.—Collected by the Community Arts Association of Santa Barbara, Calif. Edited by Carleton Monroe Winslow and Edward Fisher Brown. Second edition. 153 quarto pp. From the designs submitted in a competition inaugurated by the Association for the best design of a house to cost not more than $5,000, the Association has selected those presented in this book, and, upon application, will give information regarding the working drawings. Considerable material is included on building and financing the small home, and the designs and discussions are of great interest to prospective home owners. $1.50, postpaid. (Apply to the Association.)

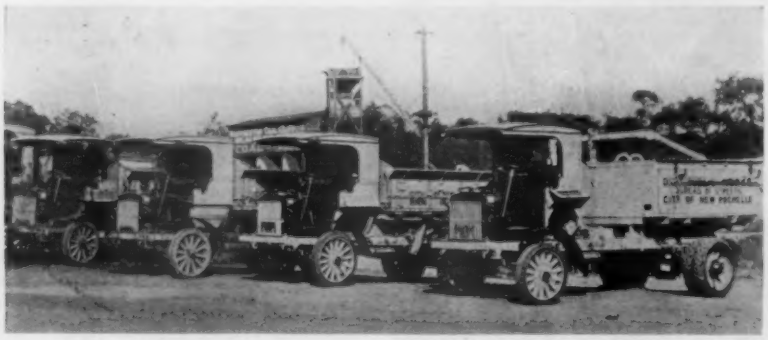
The Value of Health Department Reports.—By Ira V. Hiscock, Fellow A.P.H.A., Assistant Professor of Public Health, Yale School of Medicine, New Haven, Conn. Reprinted from the November, 1925, *American Journal of Public Health*. 4 pp. A paper read before the Public Health Administration Section of the American Public Health Association, at St. Louis, Mo., October 21, 1925. An attempt to answer the questions: Are these reports sufficiently valuable to justify the total cost, for city and state health department reports, of $75,000 a year? What is their purpose and for whom are they prepared? (Apply to the Association, 370 Seventh Avenue, New York.)

Statistics of Fire Departments.—By the Dauntless Club of the Buffalo Fire Department. 1925. 86 pp. Including the populations of cities of 50,000 or more; fire department salaries in these cities; time off allowed to firemen; allowances made for clothing, sickness and injury; size of department; and information as to two-platoon system. (Apply to the Dauntless Club, Buffalo, N. Y.)

The Pittsburgh Plan.—"Produces the Revenue; Stimulates Business; Taking the Trouble Out of Taxes." A folder on the Graded Tax Law. (Apply to Harry Barstow, Secretary, Allied Boards of Trade of Allegheny County, 210 Grant Street, Pittsburgh, Pa.)

Guidebook for Better Homes Campaigns.—Better Homes Week is from April 25 to May 1, 1925. 72 pp. Illustrated. 15 cents. (Apply to Better Homes in America, 1653 Pennsylvania Avenue, Washington, D. C.)

Sturdy Autocars Have Set a New Standard for Low Operating Costs



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*Atlantic City	*Chester	*Indianapolis	*New Haven	*Reading	Shamokin	*Wheeling
*Baltimore	*Chicago	*Jersey City	*New York	*Richmond	*Springfield	Wilkes-Barre
Binghamton	*Cleveland	Lancaster	*Norfolk	*Rochester	*St. Louis	Williamsport
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Mariemont, Ohio.—A Descriptive and Pictured Story of Mariemont—A New Town. 64 pp. Many illustrations. Mariemont, planned by John Nolen and Philip W. Foster, will be an incorporated residential village, to be governed by an elected mayor and a board of aldermen, with a city manager. It is being constructed by The Mariemont Company, the entire capital stock of which is held by Mrs. Mary M. Emery, its projector and sponsor. The undertaking is considered "a national exemplar," and is most interestingly described and illustrated in this booklet. (Apply to The Mariemont Company, 328 Walnut Street, Cincinnati, Ohio.)

Drinking Water Standards.—Adopted by the Treasury Department June 20, 1925, for drinking and culinary water supplied by common carriers in interstate commerce. Reprint No. 1029 from the *Public Health Reports*, April 10, 1925. 28 pp. Diagrams, tables. 5 cents. (Apply to Government Printing Office, Washington, D. C.)

City Plan of El Paso, Texas.—Published by the City Plan Commission. 1925. 69 quarto pp., besides maps, and including views and diagrams. An elaborate, interesting and attractive report. H. D. Slater is Chairman of the Commission. (Apply to W. E. Stockwell, Engineer and Secretary of the Commission.)

Playground Activities.—Two articles in the December, 1925, issue of *The Playground:* Special Activities for the Playground, by Charles English, Supervisor, Bureau of Recreation, Board of Education, Chicago, 5 pp.; Winter Sports, 7 pp. Both illustrated. 25 cents. (Apply to *The Playground*, 315 Fourth Avenue, New York.)

Union County Park Commission, New Jersey.—Report for period from January, 1923, to October, 1925. 47 pp., besides inserts. Attractively illustrated. An interesting report containing valuable material. (Apply to W. Richmond Tracy, Engineer and Secretary of the Commission, Administration Building, Warinanco Park, Acme and Canton Streets, Elizabeth, N. J.)

Hare System of Proportional Representation.—Supplement to the *Proportional Representation Review*, October, 1925. 8 pp. (Apply to the Proportional Representation League, 1417 Locust Street, Philadelphia, Pa.)

Traffic Control, Los Angeles, Calif.—A series of articles in the December, 1925, issue of *The Municipal Employee*, 225 Bryson Building, Los Angeles, Calif. The opening article is "Traffic Control Automatically," by R. T. Dorsey, Inspector, Traffic Control System, Los Angeles. Various phases of the subject are discussed in this and other articles in this number. (Apply to the publication.)

Report on Point of Rocks, Duluth, Minn.—Prepared by the Taxpayers' League of St. Louis County, Inc., Duluth. October, 1925. Point of Rocks is a physical projection which tends to separate the city geographically. 39 pp. Diagrams, tables. (Apply to the League.)

State Parks and Forests.—"A state park every hundred miles." 15 pp. Handy size. (Apply to the National Conference on State Parks, Washington, D. C.)

Westerly Thorofare Plan.—Report of the Town Planning Committee of Westerly, R. I. 1925. 40 quarto pp. Illustrated. Robert Whitten, of Cleveland, is City Planning Consultant in this work, and Charles F. Fisher, Associate. (Apply to Arthur L. Perry, Chairman, Town Planning Committee, Westerly, R. I.)

The Comparative Tax Rates of 215 Cities, 1925.—By C. E. Rightor, Detroit Bureau of Governmental Research, Inc. 11 pp. in the December, 1925, issue of the *National Municipal Review*. (Apply to the National Municipal League, 261 Broadway, New York.)

Essential Fire Prevention Ordinances.—Fire Prevention Bulletin Number 21 of the Insurance Department, Chamber of Commerce of the United States, Washington, D. C. 4 quarto pp. (Apply to the Department.)

Architecture and Broad Planning.—Reprinted from the *Journal* of the American Institute of Architects for June, 1925. 12 quarto pp. (Apply to Committee on Community Planning of the Institute, 56 West 45th Street, New York.)

Our Babies.—By Herman N. Bundesen, M. D., Commissioner of Health, Chicago. 68 pp. Many illustrations. (Apply to the Commissioner.)

Wakefield, Mich.—Report for 1920-1925. 75 pp. Many illustrations. (Apply to Alvin L. Rummel, Mayor.)

School Construction Program and Building Costs, 1919-1924.—A report prepared for the Detroit Board of Education by the Detroit Bureau of Governmental Research, Inc. October, 1925. 61 mimeographed pp., besides appendices. Answering the questions: Have school buildings been constructed in excess of the demand for them? Have school buildings been erected economically? (Apply to the Bureau.)

The Village Law of New York State.—A discussion of village powers, governmental organization, and prescribed methods of handling public business; recommendations to improve management of local affairs. By the Committee on Village Law of the New York State Conference of Mayors and Other Municipal Officials. Adopted at a meeting held in Albany, N. Y., October 22, 1925. 27 mimeographed pp. (Apply to William P. Capes, Secretary of the Conference, City Hall, Albany, N. Y.)

Westchester County Park Commission.—Report of the Commission to the Board of Supervisors of Westchester County, N. Y. April 30, 1925. 111 pp. Views, maps. A most interesting and attractive account of park and parkway development throughout the county, including land acquisition, and improvement and construction in a varied territory. (Apply to Jay Downer, Chief Engineer, Court House, White Plains, N. Y.)

Model Milk Ordinance.—Approved by the U. S. Public Health Service and the State Board of Health of Kentucky. Published in the *Bulletin* of the Louisville Women's City Club, 209 Bernheim Building, 638 Fourth Avenue, Louisville, Ky. 7 pp. (Apply to the Club.)

Public Health Service.—Two articles in the November 6, 1925, issue of the U. S. *Public Health Reports*. Sanitary Control of Milk—A Municipal Pasteurizing Plant; 11 pp. This is an account of a demonstration at Tarboro, N. C., of a system for sanitary control of milk supplies of towns and small cities, by K. E. Miller, Surgeon, U. S. Public Health Service. Public Health Nursing, by J. G. Townsend, Surgeon, U. S. Public Health Service; 8 pp. 5 cents. (Apply to Government Printing Office, Washington, D. C.)

Ohio Conference on Water Purification.—Report of the Fourth Annual Conference, held at Cincinnati November 12-14, 1924. 99 pp. Illustrated. Containing reports of committees, and significant papers on various phases of experience in this field. (Apply to the State Department of Health, Columbus, Ohio.)

Better Houses for Negro Homes.—Prepared and published by the Commission on the Church and Race Relations, Federal Council of the Churches of Christ in America, 105 East 22nd Street, New York. September, 1925. 24 pp. Illustrated. (Apply to the Council.)

Sanitary Code of the City of Chicago.—With amendments and additions up to and including July 15, 1925. Handy size. 468 pp. 85 cents postpaid. (Apply to Frederick Rex, Librarian, Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

How Weather Affects Traffic.—By Robbins Stoeckel, Commissioner, State Department of Motor Vehicles. Hartford, Conn. November 16, 1925. 4 pp. (Apply to author.)

What Conventions Mean to America—Their National Value.—An address by Charles F. Hatfield, of St. Louis, Mo., at the annual convention of the International Association of Convention Bureaus, held in Des Moines, Iowa, November 16, 1925. Pocket size. 35 pp. (Apply to the author, Secretary and General Manager, St. Louis Convention and Publicity Bureau.)

School Cottages for Training in Home-Making.—By James Ford and Blanche Halbert. 36 pp. Illustrated. 10 cents. (Apply to Better Homes in America, 1653 Pennsylvania Avenue, Washington, D. C.)

Methods of Financing Park Projects.—By Chas. E. Doell, Secretary, Board of Park Commissioners, Minneapolis, Minn. Reprint from the September-October, 1925, issue of *Parks and Recreation*, official publication of the American Institute of Park Executives. 8 pp. (Apply to the Institute, Rockford, Ill.)

Progress Report on Rapid Transit for St. Louis.—Relation Between Street Car and Automobile Traffic in Congested District. By C. E. Smith, Consulting Engineer. 9 pp. Maps, tables. October, 1925. (Apply to O. J. McCawley, Chairman, Civic Council on Rapid Transit, St. Louis, Mo.)

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American Society for Municipal Improvements Specifications.—Two pamphlets: Proposed Specifications for Asphalt Macadam Pavement by the Committee on Bituminous Pavements to the 1925 Convention of the Society, at Des Moines, Iowa, October 26-30, 1925, 10 pp.; Proposed Specifications for Portland Cement Concrete Pavements, Submitted by the Cement Concrete Pavement Committee, 32 pp. (Apply to the Secretary of the Society, C. W. Sammelman, 3817 Olive Street, St. Louis, Mo.)

Notifiable Diseases Reported in Small Cities, 1924.—Data from health officers in cities having 10,000 population or more. In the October 30, 1925, issue of *Public Health Reports*. The data for cities having more than 100,000 population were published in *Public Health Reports* for September 4, 1925. 5 cents. (Apply to Government Printing Office, Washington, D. C.)

Stadium Design.—By Gavin Hadden, C. E., 280 Madison Avenue, New York. A paper presented before the New York Section of the American Society of Civil Engineers, May 20, 1925. Reprinted from *The Athletic Journal*. 16 quarto pp. Photographs and plans of ancient and modern stadia, with illuminating discussion of the principles involved. (Apply to the author.)

Relation Between Heating Value of Gas and Its Usefulness to the Consumer—A Critical Review of the Published Data.—By E. R. Weaver. Technologic Paper No. 290 of the U. S. Bureau of Standards. July 21, 1925. 119 pp. 30 cents. (Apply to Government Printing Office, Washington, D. C.)

General Industrial Survey of Peru, Ind.—Prepared by the Industrial Committee of the Peru Chamber of Commerce. 21 mimeographed pp., besides illustrations. (Apply to the Chamber.)

New Values in Child Welfare.—The September, 1925, issue of *The Annals* of the American Academy of Political and Social Science, 39th Street and Woodland Avenue, Philadelphia, Pa. 203 pp. $1.00. Part I contains 12 articles under the general head of "New Values in Child Welfare." Part II, under the title, "Every-Child," presents the Proceedings of the Third All-Philadelphia Conference on Social Work—20 papers. Many points of view are presented by authorities in this field. The editors in charge of this volume are J. Prentice Murphy, Executive Secretary, Children's Bureau, Philadelphia, and James H. S. Bossard, Professor of Sociology, University of Pennsylvania. (Apply to the publication.)

Municipal Reports

CHICAGO, ILL.—Annual Report, Mayor, October 28, 1925

CHICAGO, ILL.—Biennial Report, Municipal Tuberculosis Sanitarium, 1923-1924

HARTFORD, CONN.—Annual Report, Board of Park Commissioners, year ending March 31, 1925

NEWTON, MASS.—Annual Report, Street Department, 1924

MOOSE JAW, SASK.—Audit of Accounts and City Commissioners' Report for ten months ending October 31, 1925

PASADENA, CALIF.—Annual Report, Controller of Accounts, year ended June 30, 1925

PASADENA, CALIF.—Annual Report, Health Department, year ended June 30, 1925

TRENTON, N. J.—Annual Report, Municipal Colony, 1924

On the Calendar of Conventions

JANUARY 6-7.—RICHMOND, VA.
American Forestry Association. Annual meeting. Executive Secretary, Ovid M. Butler, 1523 L Street N. W., Washington, D. C.

JANUARY 8-9.—SALEM, MASS.
New England Association of Commercial Executives. Secretary, Earl J. Arnold, Chamber of Commerce, Bristol, Conn.

JANUARY 11-12.—CHICAGO, ILL.
International Association of Street Sanitation Officials. Annual meeting. Secretary, A. M. Anderson, 10 South La Salle Street, Chicago, Ill.

JANUARY 11-15.—CHICAGO, ILL.
American Road Builders' Association. Annual convention and Road Show. Secretary, Ethel A. Birchland, 37 West 39th Street, New York, N. Y.

JANUARY 13-14.—CHADRON, NEBR.
League of Nebraska Municipalities. Annual meeting. Secretary, Theo H. Berg, City Hall, Lincoln, Nebr.

JANUARY 14-15.—WASHINGTON, D. C.
American Engineering Council. Annual meeting. Executive Secretary, L. W. Wallace, 26 Jackson Place, Washington, D. C.

JANUARY 18.—FORT WORTH, TEX.
Texas Section, Southwest Water Works Association. Eighth annual short school for water-plant operators. V. M. Ehlers, Sanitary Engineering Division, State Board of Health, Austin, Tex.

JANUARY 18-20.—OKLAHOMA CITY
National Drainage Congress. Secretary, C. R. Thomas, National Reclamation Publishing Company, 53 West Jackson Boulevard, Chicago, Ill.

JANUARY 20-21.—WASHINGTON, D. C.
National Conference on Outdoor Recreation. Executive Secretary, Arthur C. Ringland, Room 2034, New Navy Building, Washington, D. C.

JANUARY 20-22.—NEW YORK.
American Society of Civil Engineers. Annual meeting. Secretary, George T. Seabury, 33 West 39th Street, New York.

JANUARY 21-23.—CHICAGO, ILL.
American Society of Landscape Architects. Annual meeting. Secretary, Bremer W. Pond, 18 Tremont Street, Boston, Mass.

JANUARY 27-29.—BUFFALO, N. Y.
American Society of Heating and Ventilating Engineers. Annual *meeting.* Secretary, F. C. Houghton, 29 West 39th Street, New York.

JANUARY 27-29.—TORONTO, ONT.
Engineering Institute of Canada. Annual meeting. Secretary, R. J. Durley, 176 Mansfield Street, Montreal, Que.

JANUARY 28-30.—NEW YORK.
Second National Better Film Conference. Address: National Board of Review of Motion Pictures, 70 Fifth Avenue, New York.

FEBRUARY 4.—NEWARK, N. J.
New Jersey State League of Municipalities. Annual convention. Secretary, Sedley H. Phinney, 34 West State Street, Trenton, N. J.

FEBRUARY 16-17.—WASHINGTON, D. C.
National Conference on Street and Highway Safety. Secretary, Ernest Greenwood, Department of Commerce, Washington, D. C.

FEBRUARY 17-19.—SYRACUSE, N. Y.
Association of Highway Officials of the North Atlantic States. Annual meeting. Secretary and Treasurer, A. Lee Grover, State Highway Commission, Trenton, N. J.

FEBRUARY 21-25.—WASHINGTON, D. C.
Department of Superintendence of the National Education Association. Secretary, S. D. Shankland, 1201 16th Street N. W., Washington, D. C.

FEBRUARY 22-23.—CHICAGO, ILL.
American Concrete Pipe Association. Annual convention. Secretary, M. W. Loving, 111 West Washington Street, Chicago, Ill.

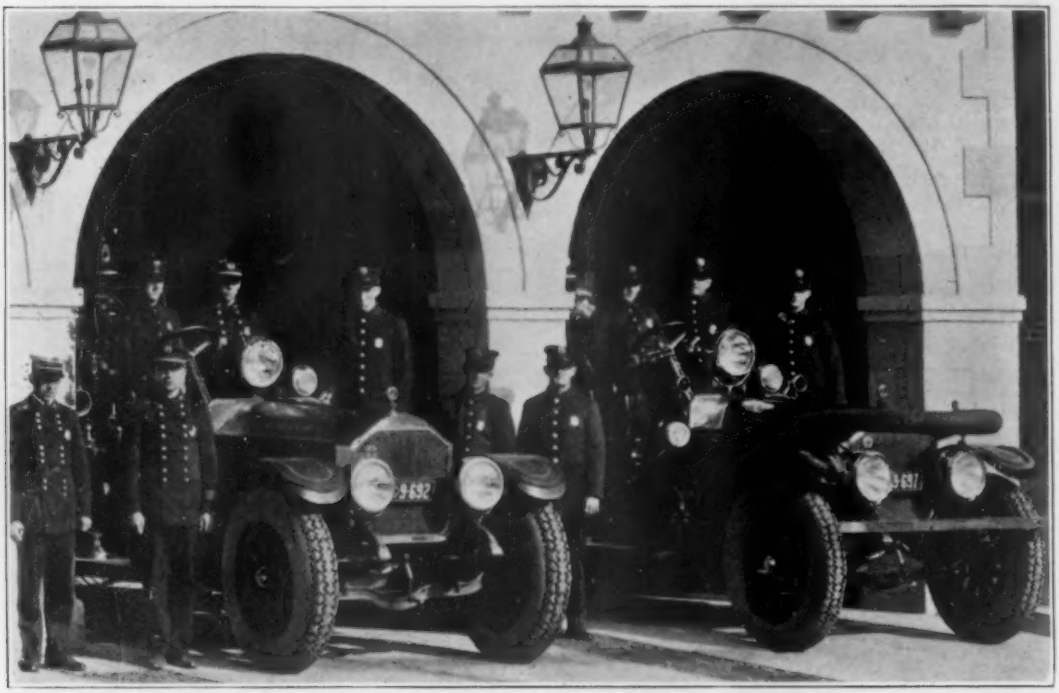
FEBRUARY 23-26.—CHICAGO, ILL.
American Concrete Institute. Annual convention. Secretary, Harvey Whipple, 2970 West Grand Boulevard, Detroit, Mich.

MARCH 29-31.—ST. PETERSBURG, FLA. APRIL 1.—WEST PALM BEACH, FLA.
National Conference on City Planning. Annual conference. Secretary, Flavel Shurtleff, 130 East 22nd Street, New York.

WEEK OF MAY 17.—ATLANTIC CITY, N. J.
American Health Congress. Address: Sally Durham Hanshue, Secretary, Committee on General Arrangements, National Health Council, 370 7th Avenue, New York.

MAY 10-13.—ATLANTIC CITY, N. J.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 40 Central Street, Boston, Mass.

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER - - - H.S. Firestone



Alhambra, California, Fire Department Apparatus equipped with Firestone Gum-Dipped Heavy Duty Pneumatics.

Firestone Pneumatics Engineered for Fire Apparatus

The exclusive Firestone non-skid tread grips on slippery streets, insures easier steering, reduces side sway, holds the road on the turns, responds quickly to brake or accelerator in traffic.

Gum-Dipping—the exclusive Firestone process, by impregnating every fiber of every cord with rubber—preserves the fabric against deterioration—minimizes friction and heat within the cords—builds extra strength and endurance throughout the cord fabric.

Longer mileage from Firestone Pneumatics brings fire apparatus operating costs down—one of the reasons why leading fire departments in all parts of the country are standardizing on Firestone.

MOST MILES PER DOLLAR

The Mark of Quality

Firestone

HEAVY DUTY PNEUMATICS FOR FIRE APPARATUS

News and Illustrations

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

The Deodorization of Noxious Gases

The Henderson-Haggard process for the deodorization of noxious gases by means of liquid chlorine has been developed to such an extent by Wallace & Tiernan Company, Inc., Newark, N. J., that they are now in a position to offer it for commercial use. This process, developed by Professor Yandell Henderson and Dr. Howard Haggard, both of Yale University, has been in use since 1921 for the deodorization of organic gases. Wallace & Tiernan Company has always manufactured the control equipment necessary for this process and has recently acquired an exclusive license covering its installation in North America.

Operators of rendering plants, garbage disposal works, packing-plants, soap factories, tallow factories, fish houses, glue factories, and the like have long been confronted with the necessity of satisfying the local health authorities that the odors produced in their manufacturing processes were not such as to inconvenience the public or injure their health. There have been many instances where plants of this nature have been forced to shut down or discontinue the odor-producing methods of manufacture because of aroused public opinion and consequent legal action.

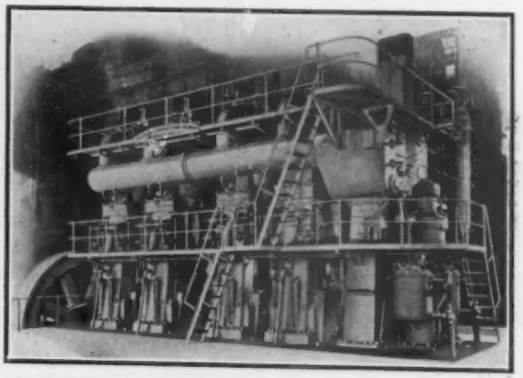
The Henderson-Haggard process, which consists of applying an admixture of chlorine and moisture to the gases at a point sufficiently prior to their final discharge to insure complete mixture, practically eliminates all organic odors and permits odor-producing establishments to operate in congested areas.

Nordberg Diesel Engines for Hollywood, Fla.

Hollywood, Fla., which was only laid out in 1923 and now has a population of 11,000, has recently placed an order for diesel engines with the Nordberg Manufacturing Company, Milwaukee, Wis. Early in the summer of 1925, an order was received by this company for a 1,250-horse-power engine, direct-connected to an 1,100-kv.-amp. generator, which is now installed and in operation. The second order was received for two more diesel units, but of 2,250 horse-power each, which are to drive 2,000-kv.-amp. generators. When these two engines are installed, the Hollywood Electric Light & Water Department will have a capacity of 5,750 horse-power in Nordberg diesel engines.

It is interesting to note that the capacity of the individual engines will be exceeded only by the three 3,750-horse-power engines now being built by Nordberg for the United States Government for service at the Panama Canal. A few years ago a 750-horse-power diesel engine was considered quite a rarity. The average size of the diesel engine built by Nordberg is rapidly increasing; this year it is about 1,725 horse-power.

The Hollywood engines will be used for furnishing all the power and light required in Hollywood as well as supplying the power needed for operating the pumps of the water system. The various projects now under way in Hollywood will soon require the entire capacity of this immense diesel plant. The city will have one of the largest white ways in Florida. One of the outstanding features of Hollywood's utilities is that the cities are enjoying a very low rate for electricity, primarily due to the low cost of power production. The diesel engines will run on low-grade fuel which costs about 5 cents a gallon in Hollywood.



THE TYPE OF NORDBERG DIESEL ENGINE TO BE INSTALLED IN HOLLYWOOD, FLA.

Precalked Joint Cast Iron Pipe

A factory-made precalked joint constructed under the most favorable and uniform conditions, thereby reducing the possibility of leakage and at the same time cutting down the cost and trouble of installation, has been developed by the McWane Cast Iron Pipe Company, Birmingham, Ala., and has been in use for many years with great success.

The McWane precalked joint cast iron pipe is the familiar bell-and-spigot type of pipe with the lead, jute, and self-tightening features inserted in the bells at the plant instead of in the user's trench. It makes it possible to lay the pipe about three times as rapidly as ordinary cast iron pipe and, according to the manufacturers, saves approximately one-half the labor. This precalked joint was invented by J. R. McWane, President of the McWane Cast Iron Pipe Company. Prominent among the improvements in the joint is that the lead is precalked half-way around the bell, thus reducing the amount of calking in the trench about 40 per cent. Bell-holes are not needed with 4-inch McWane pipe and smaller. The spigot end has been improved, there being two rings of indentations cast around the spigot end of the pipe so placed that the joint materials are forced into them by the calking. These indentations serve the same purpose as a bead, rendering a blowout impossible. The newer type of joint has an additional groove in the bottom of the bell, shown in

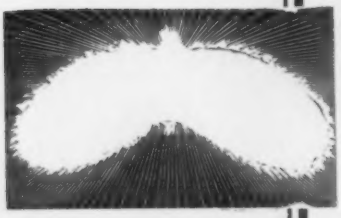
PROGRESSIVE CITIES EVERYWHERE

are

Standardizing on
ASYMMETRIC
ORNAMENTAL
Street Lighting

Westinghouse Ornamental Unit

Holophane Bilux Refractor



Light distribution of Bilux Refractor, as viewed from above.

DURING the last few years revolutionary developments have been made in street lighting, with the result that now it is possible to secure the very best ornamental lighting effects combined with efficiency such as was impossible until these units were designed.

Holophane now offers a number of asymmetric street lighting refractors which do *not* distribute the light symmetrically around the units, but direct it to the road asymmetrically to provide the best illumination.

These refractors fit into various ornamental fixtures, of which two are illustrated opposite.

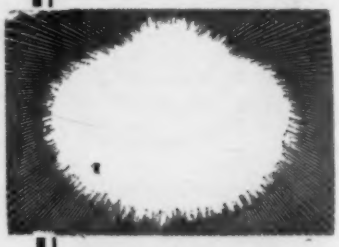
This is the street lighting of today and tomorrow.

For further information write us for a free copy of our new book—"Streets That Are Safe."

HOLOPHANE COMPANY
New York and Toronto

General Electric Ornamental Unit

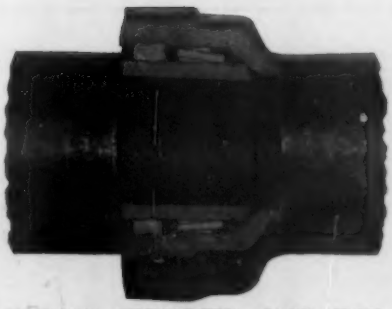
Holophane Asymmetric Dome Refractor



Light distribution of Asymmetric Dome Refractor, as viewed from above.

HOLOPHANE

DIRECTS LIGHT SCIENTIFICALLY



THE McWANE PRECALKED CAST IRON PIPE JOINT

the diagram, and a layer of braided jute is placed in the bottom of the bell before the wedges are inserted. When the calking is done, this jute is crowded into the groove, making a joint at the bottom as well as at the top and giving additional rigidity without sacrificing any advantages.

The McWane precalked joint is made about a mandrel while the pipe is in a vertical position. The mandrel, being slightly larger than the pipe it represents, provides ample clearance for the entry of the latter. In the order named, braided jute, a specially prepared ring of iron wedges imbedded in lead, two more braids of jute, and a final filling of molten lead are placed in the pipe bells around this mandrel. What will be the lower half of the joint circumference in the trench, is then precalked.

The function of the wedges is not only to carry the force of the blows from the top to the bottom of the joint, thus insuring rigidity and tightness, but also to automatically tighten the joint materials in case of excessive strains which might tend to deflect the line. At present, McWane pipe is made in 1¼-, 2-, 3-, 4-, 6, and 8-inch sizes. The 1¼-inch size is cast in 5-foot lengths. In carload quantities the company can calk two lengths of 1¼-inch pipe together at their foundry before shipping, without extra charge, giving the purchaser 10-foot laying lengths, which is a decided advantage.

George D. Kirkham to Retire from American Steel and Wire Company

According to a report received from B. B. Ayres, Advertising Manager, American Steel & Wire Company, 208 La Salle Street, Chicago, Ill., George D. Kirkham, Sales Agent of that company, retired December 31. Mr. Kirkham first came with the company as Sales Agent of the old Washburn & Moen Manufacturing Company, of Worcester, Mass., in 1886. That company was taken over by the American Steel & Wire Company, 27 years ago.

Mr. Kirkham has been very active in business and civic organization and has a very wide circle of friends both in the North and in the South. He plans to spend most of his time in the South during the winter, after which he will join relatives in Chicago, who are planning to motor through the western and Pacific coast states next summer and fall.

New National Pipe Sales Offices

The National Cast Iron Pipe Company, Birmingham, Ala., has recently established new sales offices at 610 Bisbee Building, Jacksonville, Fla., and 417 Kearns Building, Salt Lake City, Utah.

International Motor Company Buys New Factory

The International Motor Company, 25 Broadway, New York City, has purchased the Niles-Bement-Pond Company, located in Plainfield, N. J., as part of its expansion program. The factory real estate of this company now comprises 172.8 acres of land and 2,048,000 square feet of floor space, having formerly been 157½ acres, including 1,728,000 square feet of floor space. These figures do not include buildings in course of construction at the Allentown, Pa., plant.

The new Plainfield property includes a modern machine shop, foundry and erection buildings having a total floor space of 320,000 square feet. The purchase also includes a modern power-house. The plant will be occupied by the International Motor Company's General Service Department, now located at New Brunswick, N. J. Primarily, this move is being made in order to afford better service to the company's 95 direct factory branches located throughout the country.

A Backwater and Sewer-Gas Valve

A valve for sealing waste pipes in residences, public buildings, and other places where a perfect seal against backwater, vermin and disagreeable sewer gases is necessary, is being marketed by the Kennedy Valve Manufacturing Company, Elmira, N. Y. This Kennedy-Pennie valve is positive in action and may be installed in any position. The counterbalanced disc avoids resistance

SEWER ODORS IN BUILDINGS ELIMINATED BY THIS VALVE

to the outflow of sewage, but the bronze disc quickly returns to the sealed position if there is any back flow.

The valve disc is of bronze and acts against a machined bronze seat to give a tight fit. The closure is insured by a balanced counterweight weighted with lead to suit the valve position. No lead is required for horizontal position. Counterweighting may be done without removing the valve or disc. The cap over the weighting cup is removed, the cup is placed on a smooth surface or wiping rag, and sufficient lead is poured in through the opening to make the valve-disc swing at the right angle and the countersunk holes anchor the lead. The disc, seat, hinge-pin screws, cover bolts and nuts are made of non-corrosive bronze and are very durable. This backwater valve is made for standard or extra-heavy soil pipe as desired, and is tested before delivery.

The Lure of a Well Lighted City

WHAT does better street lighting attract?

More business—new industries—new retail customers—new beauty—newly awakened civic pride. Are these the only attractions to be credited to the lure of light? Far from it. The solid advance in real estate values—the *permanence* of city improvement—these are two more outstanding results no well wisher of his city should overlook. And there are many more.

Your city, doubtless, needs better lighting now in some one section or in several neighborhoods. You will have to solve the problem of *economical permanence* of the system adopted—a permanence hand in hand with unquestioned architectural beauty of the units employed in the system itself. In helping you solve this problem—the King organization extends the lessons learned in a commercial lifetime of street lighting specialization.

A BOOK OF STREET LIGHTING FACTS FOR YOU

This book is a complete outline of better street lighting facts with illustrations of King standards and data relative their installation. We will gladly send a copy gratis to those who desire to investigate the whole big subject.

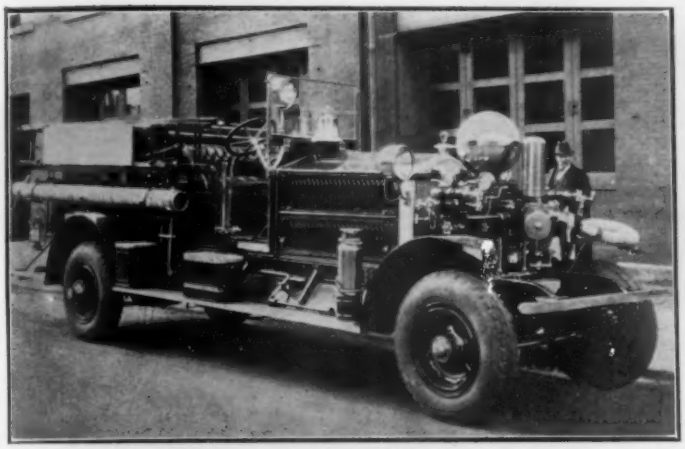
Send today for complete information on this important civic improvement.

KING COMPANY.

The World's Foremost Manufacturer of Street Lighting Standards

230 SOUTH CLARK STREET

Chicago, Ill.



THE NEW AHRENS-FOX UNIT PURCHASED BY DUBUQUE, IOWA

Old Ahrens Pumper Meets Latest Tests

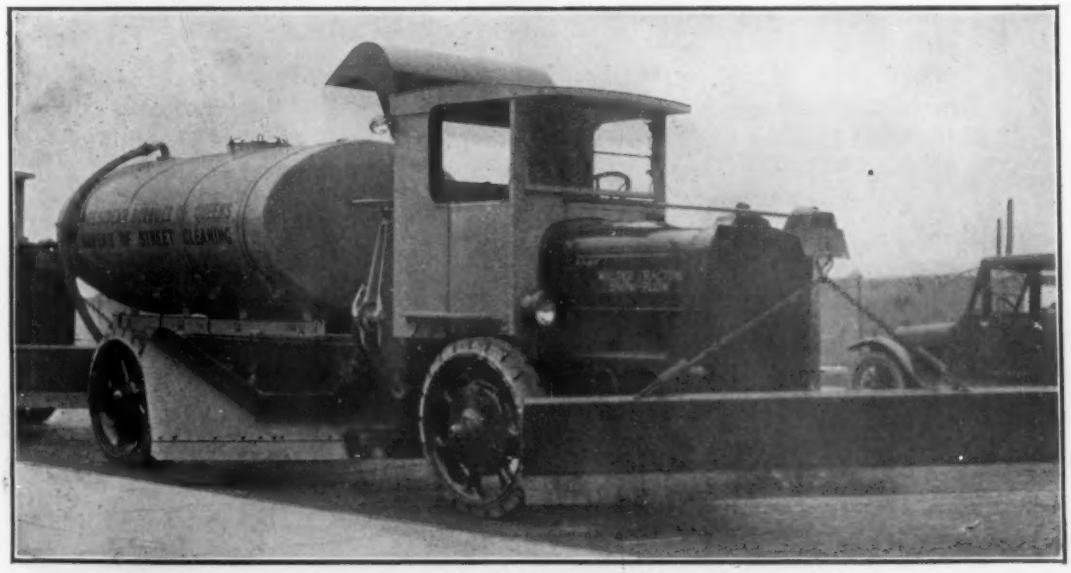
According to J. W. Fisher, Chief, Fire Department, Dubuque, Iowa, the old Ahrens pumper purchased some time ago from the Ahrens-Fox Fire Engine Company, Cincinnati, Ohio, on August 1, 1925, easily met all of the tests of the Underwriters for a 4-cylinder, 750-gallon unit. The showing made in this test was a surprise to the local officials, as the pump had the original valves and springs which were in the engine when it was delivered about nine years ago. Based on this showing, the city of Dubuque has purchased a new Ahrens-Fox 1,000-gallon pumper.

Dean Now Vice-President of American Vibrolithic Corporation

The American Vibrolithic Corporation, Des Moines, Iowa, has recently announced the appointment of Colonel Norman D. Dean as Vice-President in charge of operations. Colonel Dean's duties will be directly associated with the sales, construction, and technical aspect of Vibrolithic pavement and Interlocking bituminous pavement, as well as the extension of their uses. Colonel Dean has had many years of experience in foreign and domestic affairs in the Corps of Engineers, U. S. A., embracing many tours of duty dating from the building of the Panama Canal, to and including the World War. As a consulting and construction engineer in civil capacity, he has been engaged in engineering works of note in the United States, Ecuador, Brazil, the West Indies, Morocco, France and Australia. Colonel Dean will be located at the executive office of the company, 935-36 Insurance Exchange Building, Des Moines, Iowa.

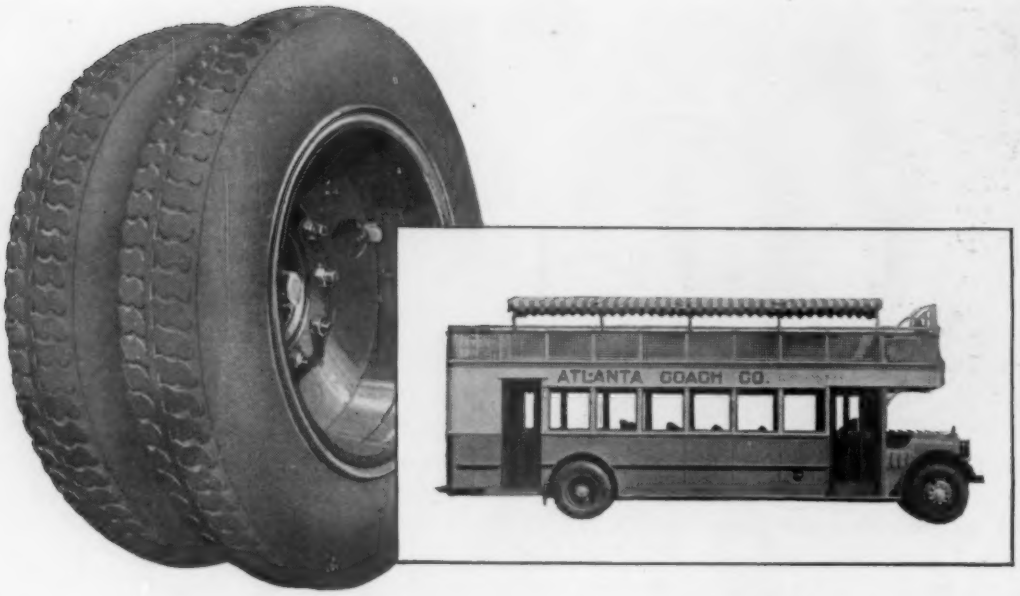
New Harnischfeger Distributors

The Harnischfeger Sales Corporation, distributor for the Harnischfeger Corporation, Milwaukee, Wis., has announced the location of a new branch office in the Independence Trust Building, Charlotte, N. C., with W. G. Henry in charge as District Manager.



A COMBINATION WALTER SNOW FIGHTER AND FLUSHER RECENTLY DELIVERED TO THE BOROUGH OF QUEENS, CITY OF NEW YORK

A duplicate of this job was recently purchased by Hoboken, N. J. The tractor unit is a powerful four-drive machine with five forward speeds. The front plow is used to remove the deeep snow, and the special center scraper plow scrapes down to the road surface. The flusher equipment is a Studebaker model of 1,500 gallons capacity, the flusher pump being driven directly by the tractor motor. In summer the snow blades are removed, so that the unit is profitably used as a flusher in the regular way. In winter the snow blades are attached and the machine is made ready for snow fighting. In the spring when the snow thaws, it is possible to use the plows in combination with the flushing nozzles to clean away the dirty slush and snow



Atlanta double-deckers are shod to save Atlanta Streets

MANY cities have transit problems. Atlanta for one doesn't believe in having paving problems, too. She puts her double-decked buses on Budd-Michelin Dual Wheels and pneumatics to save the city streets.

Washington, Detroit, Milwaukee, Cincinnati, Los Angeles and Albany have done the same. Buses in these cities ride on air. What a difference that makes to the paving! It saves 87 per cent of the wear and tear. It diverts thousands of dollars a year from the repair budget to new street construction. It pleases the motorists who use the city streets and the taxpayers who have to foot the bills. It means buses that roll along without jolting the passengers or shaking the neighboring houses as they pass.

We welcome queries from city officials who want to be shown.

BUDD

WHEEL COMPANY

Philadelphia

New Cleveland Representative for Climax

The Climax Engineering Company, Clinton, Iowa, has announced the appointment of T. L. Keeling as Sales Representative, with offices at 657 Leader Building, Cleveland, Ohio. Mr. Keeling will have charge of the sale of Climax internal combustion engines in Ohio, western New York, and western Pennsylvania. He has been connected with the company for five years and has a fine record as an expert in solving problems involving the use of industrial gas engines.

Garbage Collection Trucks

An interesting report on the use of Anthony bodies on garbage trucks in Peoria, Ill., has become available from Sherman A. Hunt, Superintendent of the Garbage Department.

In June, 1925, the first garbage body for use in Peoria was purchased from the Anthony Company, Inc., Streator, Ill. About the first of August two more of these bodies were added. In a given territory where 4 men were formerly taking care of 12 loads a day on a 5-mile haul, 2 trucks with 4 men are handling the same haul, taking 20 loads a day.

The first week of November a check was made on two of the trucks, working in a territory where the average haul was shorter. The result was that one truck hauled 104 loads and the other 96 in 6 working days, making a total of 200 loads. It is estimated that these two trucks hauled approximately 300 tons of garbage per 6 days, or about 25 tons a day per truck.

Mr. Hunt reports that the Anthony bodies have been entirely satisfactory in every respect. Furthermore, it is interesting to note that they dump on level ground and that in spite of this the bodies always dump clean. The driver does not leave his seat, but drives up to where he wants to dump, trips the lever and drives away without losing any time. There are still 20 teams in use in Peoria service, but they are to be replaced with trucks as fast as possible, according to the report.

The Jaeger Portable Power Corporation

The recent incorporation of the Jaeger Portable Power Corporation, 1326 Woodbridge Street, Detroit, Mich., with an authorized capital of $400,000, creates a new unit for the manufacture of portable equipment for municipalities and contractors. The four units now being manufactured by the new corporation include:

1. The Fyr-Foe twin pumper, which is a high-pressure pump, capable of throwing a stream of water over a four-story building or 125 feet on the level. This has been developed to meet the needs of towns and villages that do not have the financial resources to purchase high-priced fire-engines and pumpers.

2. The Jaeger pump, which is designed to meet the needs of general contractors and public utilities. It is designed for pumping out manholes, excavations, etc., where water and mud are a serious hindrance to the work being carried on.

3. The Jaeger Portable Woodworker, which is designed especially for contractors and builders, as it enables them to use power saws right at the new building that is being erected. It does away with the necessity of most hand sawing and greatly reduces carpenter labor costs.

4. The Jaeger portable power take-off, which is adapted to meet the needs of farmers and contractors, as it will run buzz-saw, feed grinder, hay baler, silo cutter and filler, pump-jack, clover huller, cream separator, concrete mixer, and, in fact, all stationary machinery used around a farm or on ordinary small contracting jobs, where not more than 15 horse-power is required.

The words "portable power" set forth the basic principle underlying all of these machines. This is accomplished by engaging a special shaft in the portable machine with the crank-shaft of the motor on either passenger cars or trucks. Then, by means of belt pulleys, heavy-duty clutches and the other equipment necessary, all of the power in the automobile engine is made available for the special use desired without in any way using or affecting the rest of the motor car. The advantage of this is that there is no harmful effect on the car what-

SPECIAL GARBAGE BODIES EQUIPPED WITH AUTOMATIC TAIL-GATES AND STEPS ON EACH SIDE, BUILT TO ORDER FOR THE GARBAGE DEPARTMENT OF PEORIA, ILL.

Big Returns From a Small Investment

The steadily increasing use of the Fordson tractor for a wide variety of municipal work is a good indication of the splendid satisfaction which these machines are giving.

Winter and summer, Fordson tractors provide power for such city jobs as *excavating, sewer work, back filling, road and street construction and maintenance, garbage disposal, pumping or general hauling.*

A typical instance is cited in the experience of the village of Hinsdale, Ill. Four years ago a Fordson was purchased primarily to operate a mud pump in an open drainage ditch. When this job was completed the Fordson was attached to a 5-yard dump wagon. It has replaced three horses and an extra man, hauling cinders besides being much faster on the road.

In countless cities, large and small, all over the United States the Fordson Tractor is being used to cut costs and speed up municipal work.

Fordson Tractor

$495

f. o. b. Detroit

Your nearest authorized Ford dealer will gladly get the facts on Fordson performance.

Ford Motor Company
Detroit, Michigan

Fordson

soever, inasmuch as the only part being used is the power-plant in the car.

The officers of the new corporation are: President and General Manager, Roy E. Wing, who is also President of the Detroit Nut Company, Secretary-Treasurer of the International Screw Company, and former Production Manager of the Burroughs Adding Machine Company; First Vice-President, Alfred T. Wagner, who is also President of the A. T. Wagner Foundry & Supply Company; Second Vice-President, Charles F. Jaeger, former contractor and builder, who is the inventor of the Jaeger Portable Woodworker, the first unit to be manufactured; Secretary, Earnest R. Baldwin, who is also Secretary-Treasurer, and General Manager of the Detroit Nut Company; Treasurer and Director of Sales, Elwood Sampson, who recently resigned as Executive Secretary of the Purchasing Agents Association of Detroit to go with the new corporation; Factory Manager and Director, H. A. Dorman, who was formerly President and General Manager of the Larned Tool & Die Company; Director, A. H. Schenck, who is the Director of Purchases of the Burroughs Adding Machine Company.

WELL-BUILT MOWER FOR USE ON PUTTING-GREENS

An Improved Putting-Green Mower

The greens mower designed and manufactured by the Ideal Power Lawn Mower Company, Lansing, Mich., was designed particularly to meet the present-day demand for a high-grade, close-cutting, easy-running mower for use on modern golf greens where accuracy and close work are the prime essentials. In building this mower the manufacturer gave special consideration to the desire on the part of golfers and greens keepers for better greens. First, a thorough study was made of the conditions that actually exist in the grounds, and then a study was made of the various mowers that are being built for putting-green use.

First, the design was made to reduce friction at every point possible, using anti-friction bearings, either of the roller or ball type. Simplified adjustment is featured, and machine-cut gears are used throughout the machine. The accompanying illustration shows one of the mowers assembled, with its light-weight, substantial construction and neat lines.

Phillips in Charge at Wilkes-Barre for Allis-Chalmers

The Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has announced that C. F. Phillips has been appointed representative in charge of its Wilkes-Barre office. Mr. Phillips, who was formerly connected with the Philadelphia office of this company, succeeds Guy V. Woody.

The Fulton Finance Company

The Fulton Iron Works Company, St. Louis, Mo., realizing the importance of making adequate provision for extending terms to purchasers of Fulton diesel engines and for financing companies contemplating new factories or rehabilitating those now in operation, has organized a new corporation, known as the Fulton Finance Company, under the laws of the state of Delaware. This company is owned by the Fulton Iron Works Company and has a paid-up capital of $500,000 and an authorized note issue of $2,500,000, of which $1,200,000 is issued and outstanding.

The formation of the Fulton Finance Company will enable the Fulton Iron Works Company to extend the credits which the nature of its business makes necessary and thus permit it to increase the scope and volume of business in the sale of diesel engines, and render a greater service to its customers.

Detroit Places Big Switching Equipment Order

The contract for furnishing the switching equipment for the municipal power-station and three main substations which will furnish power for the Detroit municipal street railways and street lighting system, has been awarded to the Westinghouse Electric & Manufacturing Company. The generating equipment was built and delivered a short time ago by the same company and consisted of three 25,000-kv.-amp., 13,800-volt unit transformers for distribution to the substations at 24,000 volts by auto-transformers. The installation is to be made in the Morrell station, which will ultimately have a capacity double the original 75,000 kv.-amp.

The three substations will be automatically controlled and will contain automatic railway and lighting feeder equipment, all of which will be supervised and controlled by supervisory control equipment from the dispatcher's office in the Morrell station.

The contract just let includes 56 truck-type oil circuit breakers for the house auxiliaries, 78 single-pole, segregated-phase, 19,800-ampere, 24,000-volt circuit-breakers for the generating station, and 40 3-pole, single-throw, 600-ampere, 25,00-volt circuit breakers for the three substations. The contract also includes a section control desk and switchboards totaling 90 panels for the power-house and two 18- and one 15-panel switchboard for the substations.

A COUPLE of years ago, some of the merchants along State Street, Chicago, got together and did a little figuring. The result was that some $2,000,000 were chalked up as the cost of a single snow storm. The items that made up this figure were composed of such as these:

Loss in business, delayed deliveries, delayed shipments, lack of customers. A $2,000,000 loss means, in Chicago, almost $1.00 per head on the population.

And then add to this figure the cost to each resident of the town—both the cost in actual cash, and the cost in inconvenience.

Main Street isn't much of a street if it allows the family flivver to become buried in a snow bank.

But the sign at the top of this advertisement: "Here lies Main Street", can be taken down. It is merely a question of getting action on it.

A single Barber-Greene Snow Loader does the work of a gang of from 100 to 200 men. And it will work day and night till its job is done.

Our latest booklet: *Modern Snow Removal* shows how a number of towns and cities, the size of yours, have definitely licked this problem.

As a taxpayer—as an automobile owner—as a merchant—as a business man—you probably want a copy of it. And if you will send the names and addresses, we will forward additional copies to any of your friends or city officials who may be interested.

BARBER-GREENE COMPANY—*Representatives in 50 Cities*—515 W. Park Ave., Aurora, Illinois

BARBER GREENE
SNOW LOADERS

Sullivan Office Changes

The Sullivan Machinery Company, 122 South Michigan Avenue, Chicago, Ill., through its Advertising Manager, S. B. King, has announced two changes in office addresses. The Cleveland office of the company, hitherto at 701 Rockefeller Building, Cleveland, Ohio, has moved to 1506 Rockefeller Building, in order to secure additional space. R. T. Stone is Cleveland manager.

The office of the Sullivan Machinery Company in Sydney, New South Wales, where R. D. Willets is Manager, has moved from Australasia Chambers, 3 Martin Place, where it has been located for the past fifteen years, to Kembla Building, Margaret Street.

MARKING A TRAFFIC LINE ON A BAD CURVE, WITH A LINE-O-GRAPH

Haggart Elected Vice-President of Republic

The Republic Truck Sales Corporation, Alma, Mich., has announced the election of J. C. Haggart, Jr., as Vice-President of the Republic Motor Truck Corporation, Inc., Alma, Mich. Mr. Haggart has been associated with the Republic truck company for the last five years, both as Chief Engineer and as Assistant to the President.

Three Massachusetts Towns Install New Complete Police Signal Systems

Reading, Wakefield, and Plymouth, Mass., have recently installed complete new police signal systems, equipped with a recall attachment which enables the police chief to communicate with the officers on patrol duty in cases of emergencies. These systems were purchased from the Gamewell Company, Newton Upper Falls, Mass.

The Reading system consists of one portable police recording set, five Exemplar police boxes and five recall flashlights. The Wakefield installation consists of one 4-circuit police desk, ten Exemplar boxes mounted on combination fire and police pedestals, and six recall flashlights. The Plymouth installation consists of a 2-circuit police desk, six Exemplar police boxes, six recall flashlights and six recall horns. An auxiliary police box is installed in each of the Plymouth banks, and also in one mill, being used in the latter case as a watchman's box.

Randlett Now with Robert W. Hunt Company

The Robert W. Hunt Company, Inspecting, Testing and Consulting Engineers, Chicago, Ill., have announced the appointment of Fred M. Randlett as district manager of the Pacific Northwest territory. Mr. Randlett has been chief engineer of the Water Department of Portland, Ore., for the last eight years and previous to that time was engaged in the engineering department of the New York, New Haven & Hartford Railway and with Stone & Webster, Inc.

Marking Traffic Lines by Machine

The Highway Model of the Lino-O-Graph is a practical traffic and safety zone marker, especially designed and manufactured for marking streets and public highways, by the Line-O-Graph Company, 17 East 42nd Street, New York. This machine is operated by one man, doing away with hand painting and brushes, and marks with any kind of highway paint.

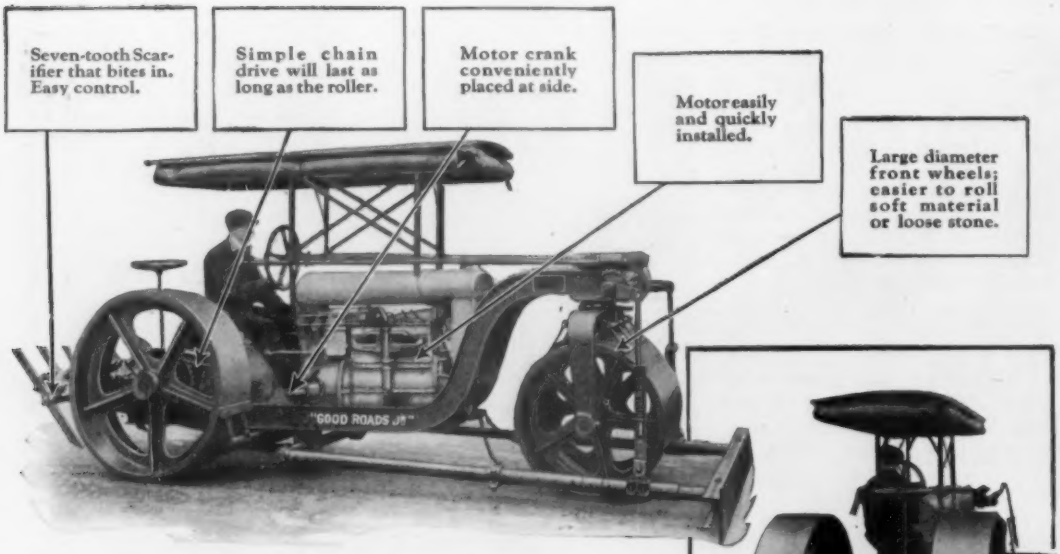
The special flexible spreaders which are used with the Line-O-Graph are made in all recognized widths of line for safety marking. The Highway Model of the Line-O-Graph has a 6-gallon tank specially designed to take the usual 5-gallon can of paint. One gallon of highway paint will mark approximately 300 linear feet of pavement 6 inches wide.

After using the machine, all that is necessary is to remove the all-metal flexible spreader which takes the place of brushes and place it in a detachable container, which contains sufficient kerosene oil to fully cover it. The spreader is thus easily cleaned and kept ready for instant use without additional labor.

New West Virginia Sales Office for Mathieson Alkali

The Mathieson Alkali Works, Inc., 250 Park Avenue, New York, has announced the establishment of a new district sales office in Fairmont, W. Va., with W. C. McAdoo in charge as District Sales Manager. The territory to be handled by the new Fairmont branch office includes nearly all of West Virginia, the southwestern section of Pennsylvania, and a number of cities located on the Ohio side of the Ohio River. In the past this has been part of the Philadelphia office territory, but the division is made because it is believed it will be of mutual advantage to the customers and the company itself.

Complete warehouse stocks of Eagle-Thistle soda ash, caustic soda, liquid chlorine, bleaching powder, and chlorine products for prompt delivery to consumers will be carried at the Fairmont warehouse.


Seven-tooth Scarifier that bites in. Easy control.
Simple chain drive will last as long as the roller.
Motor crank conveniently placed at side.
Motor easily and quickly installed.
Large diameter front wheels; easier to roll soft material or loose stone.
"GOOD ROADS JR"

Good Roads, Jr.

A complete outfit for building and maintaining roads

ROAD roller—scarifier—leveler—scraper—all in one—this new member of the dependable Good Roads Machinery line has a special appeal for those who aim to reduce the growing costs of highway construction and maintenance.

Right at the start, it means a smaller investment, because it combines all the necessary equipment in one machine.

Here's what the Good Roads, Jr. will do:

1. Scarify a dirt, gravel, cinder, or stone road.
2. Plane, grade, and form the road bed.
3. Roll roads or drives—new work or maintenance.
4. Pull a sprinkler, a grader, or wagons loaded with materials.

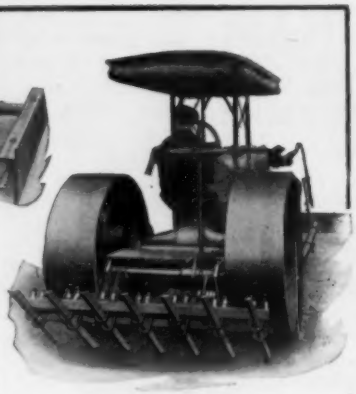
And it does all this at surprisingly small cost. Extremely moderate consumption of gas and oil. Does not require an expert to operate it.

No wonder we say the Good Roads, Jr. will pay for itself in a short period of use. You'll say so, too, after you've seen it work . . . and we're always glad to arrange a demonstration without obligating you in any way.

Write for full details today. Ask for 1926 catalog.

THE GOOD ROADS MACHINERY CO., INC.
KENNETT SQUARE, PENNA.

Service and delivery branches in principal cities



Everything for the Road Maker

Road Graders
Road Drags
Road Oiling Machines
Heating Kettles
Rock Crushers
Steam Road Rollers
Tandem Rollers
Engine and Boiler
Corrugated Culvert Pipe
Gravel Screening Plants
Car Unloaders
Road Plows
Rooter Plows
Drag Scrapers
Wheel Scrapers
Dump Wagons
Sand and Gravel Plants
Street Sweepers

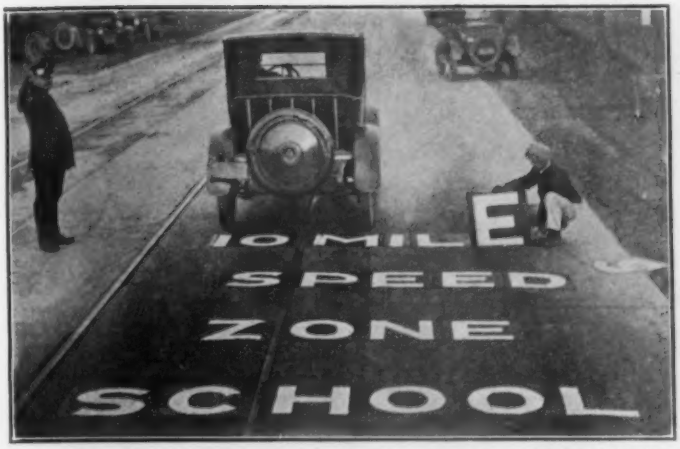
New!
Good Roads
Motor Grader!

See it at the Chicago Road Show

TRADE Good Roads MACHINERY MARK

Good Roads MACHINERY

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.



APPLYING WAMBLU TRAFFIC LETTERS TO THE ROADWAY

A New Type of Traffic Sign

An entirely new method of marking traffic directions on pavements has been developed by Eugene F. Wambach and Emil M. Blutau of the Wamblu Paint and Varnish Works, Ridge Road, Rochester, N. Y. This new traffic marker is a self-painter and self-guide, constructed of a cotton warp completely impregnated with paint and attached to the smooth street surface by an adhesive which is vulcanized into the fabric. This makes it almost irremovable and indestructible by climatic or atmospheric variations.

Each letter is 3 feet high or may be made of any dimensions desired, and consists of the cotton warp on which the needed letter is painted, in whatever color is ordered, on a background of black. The lettering usually is painted in white, as that color makes a striking contrast with the black and is easily discernible at a distance or close up. The paint is not applied by a brush, but is sprayed and infused by a blowing process. The lettering is kept in scientific harmony with standard forms, and on a 3-foot square background it is plainly visible at a long distance.

The cotton warp flap painted on its upper surface is given a coating of adhesive on the back, making it stick to the pavement like a porous plaster. The flaps are placed in harmonious circles or straight lines, this operation being regulated and governed by street formations, and so rapidly does the adhesive back stick to the pavement that vehicles are permitted to run over the new cotton signs immediately, thus avoiding interference with traffic. After autos have run over these colored signs a few hours, the impression of the lettering adheres permanently to the pavement beneath.

A Really New Swing

A real innovation in swings in which any boy or girl can "work up," or "pump," as it is known in some parts of the country, has been developed by the American Playground Device Company, Anderson, Ind. Working up or pumping is not permitted on public playgrounds where the standard swing seat is used, but the nature of the children does not change and cannot be changed; they always want to see how high they can swing themselves. This new unit is so arranged that two people face each other and gradually work themselves up to considerable heights, or one person in the swing can do the same by pushing alternately with feet and hands.

A SWING ANY YOUNGSTER WILL ENJOY

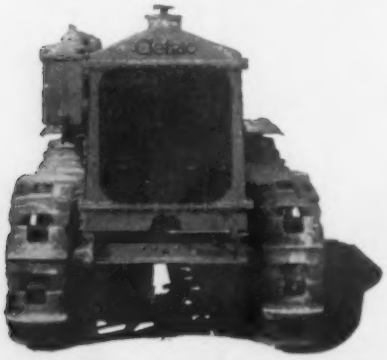
Cletrac
Crawler Tractors

Low Cost Power for All Road Work

INTRODUCED in 1925, the Cletrac "K" represents modern design, engineering and construction—for its weight the most powerful tractor obtainable—and [illegible] such low cost as to be astonishing. The Model "K" combines light weight and pulling power to a degree never before developed in a tractor. The instantaneous oiling system—found in no other tractor—provides for oiling the lower track wheels while the tractor is in motion—thus economizing in time and effort—tremendous factors in reducing the cost of work performed.

"K"

THE Cletrac "K" does the work of many teams, reducing the cost per yard of earth moving. And its ready adaptability to every working condition on the road makes it the most satisfactory power unit for the road builder.



Cletrac Low Cost Power Multiplied

Plowing — scraping — grading — levelling—finishing! No matter what the work may be, a Cletrac "K" handles it easily and profitably. In sandy loam, heavy clay, or rocky soil this sturdy tractor is equally at home. On steep grades, loose ground and boggy soil, it is truly remarkable in efficiency. The Model "K" handles every type of road machinery successfully. Its crawler construction means extra traction —easy handling—short turning.

Write or wire—TODAY—for road folder which illustrates and explains how contractors are benefiting by the Model "K" Cletrac low cost power.

The Cleveland Tractor Co.

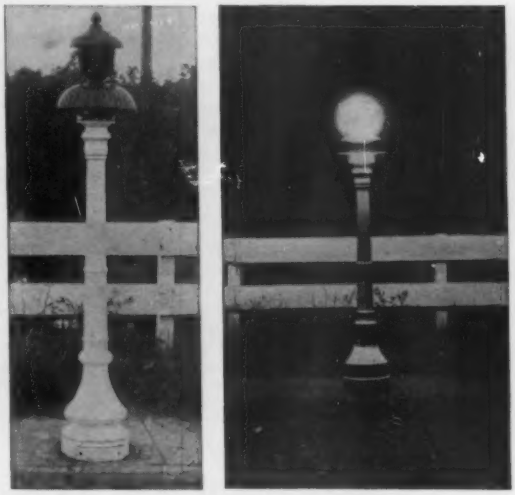
Cleveland, Ohio

Heavy double seats are hinged between horizontal uprights. There are galvanized-pipe hand and foot rests, all suspended from the pipe frame with hot-galvanized chains and roller bearing clamp hangers. They have proved so popular in municipal playgrounds that some private amusement parks have installed them and are charging five cents to ride ten minutes, resulting in gross receipts of over $800 per swing during a season.

Traffic Warning Beacons

In the past much trouble has been experienced in endeavoring to light dead-end streets, heavy traffic sections, and safety zones for street-car passengers in such a way as to give ample warning to approaching motorists. Red bull's-eyes and lights have not proved entirely satisfactory because there was not sufficient illumination of the standard holding the warning light, nor were pedestrians and other objects standing near it sufficiently illuminated for their protection.

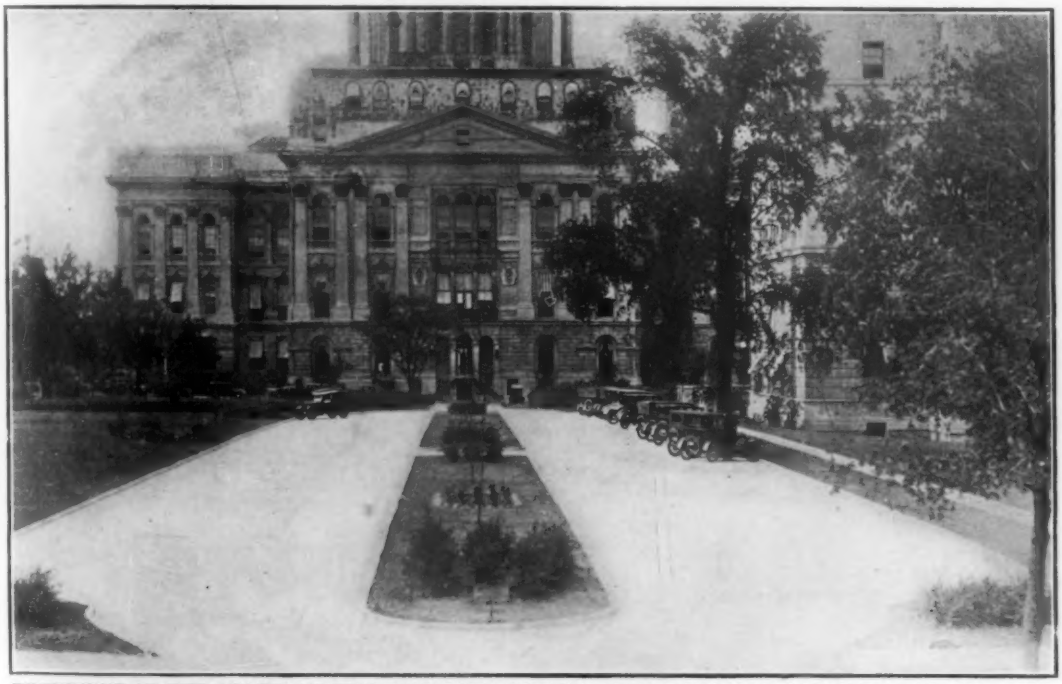
To meet this problem, engineers of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., have designed a traffic warning beacon having an auxiliary source of white light for the illumination of the standard itself and the objects in a small area surrounding it. The white light source for this purpose is not visible to the motorist, although it is capable of illuminating an area of approximately 200 square feet when the beacon is mounted at a height of 6 feet from the ground. The white light is not flashed, but turns steadily, while the warning light in a ruby red bowl-type refractor is periodically flashed by a mercury contact switch located in the base of the standard. Experience has already demonstrated the psychological effect on the motorist who approaches one of these units is such as to afford an appreciation of the signal and its meaning.



DAY AND NIGHT VIEWS OF NEW SOL-LUX FLASHING TRAFFIC BEACON

New Simplex Wire Branch Office

The Simplex Wire and Cable Company, Boston, Mass., has recently opened a branch office in the Lew Building, St. Augustine, Fla., in order to better care for the steadily increasing volume of business in that state. F. H. Pettee, who has represented the company in Florida for the last two years, will be Manager of this office.



DRIVEWAY OF THE STATE CAPITOL, SPRINGFIELD, ILL., OF TEXACO ASPHALT MACADAM OVER OLD MACADAM

steady

Steady because reliable.
Steady because enduring.

"Caterpillar" Tractors deliver *steady* power—uninterrupted work when motorists chafe at a "detour" sign—speedy, sure completion of the job of road making or maintenance.

A healthy habit of holding at work even though weather and footing be unfavorable.

Stamina and endurance that set the pace for whole crew.

CATERPILLAR TRACTOR CO.
Executive Offices
SAN LEANDRO, CALIFORNIA, U. S. A.

Factories:
San Leandro, Calif.
Stockton, Calif., Peoria, Ill.

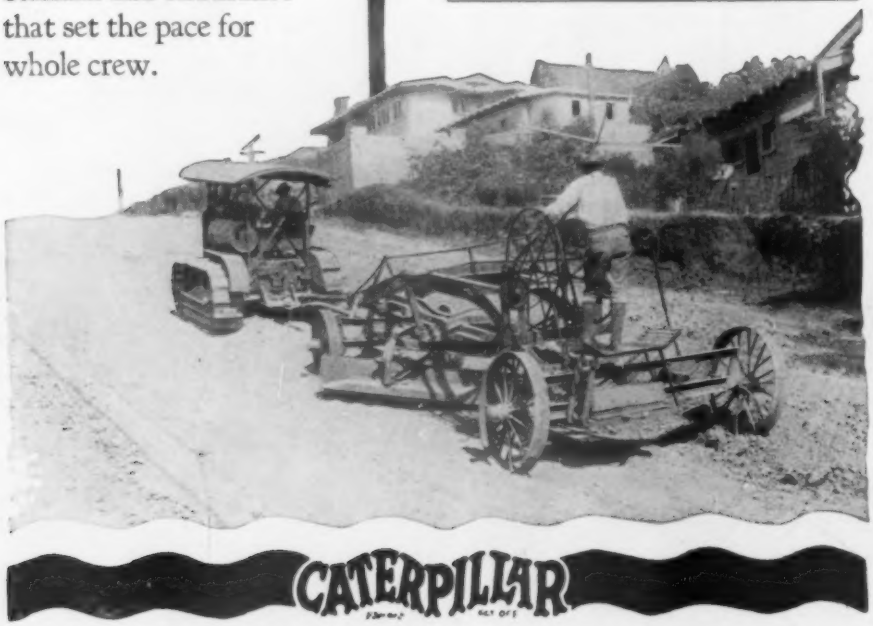
Offices:
New York City
San Francisco

Successor to:

BEST
C. L. Best Tractor Co.

HOLT
The Holt Manufacturing Company

Prices on "Caterpillar" Tractors
F. O. B. Peoria, Ill.
10-Ton, $5950 5-Ton, $3650 2-Ton, $1950
F. O. B. San Leandro, Cal.
Sixty - $5500 Thirty - $3400



CATERPILLAR

TRUCKS ARE LOADED WITH AMAZING RAPIDITY WITH THIS TYPE OF EQUIPMENT

New Fordson-mounted Snow Loader

To help meet the enormous yardage requirements of snow removal under the difficult conditions imposed by slippery pavements and all kinds of snow, varying from snow in a feathery condition to slush or ice, the Nelson Iron Works, Inc., Passaic, N. J., has developed a loader particularly for this service. Although designed particularly for snow work, this loader is not solely a winter tool. Without alteration, it is ready and available for general loading service in sand, gravel, dirt, or ashes during the other nine months.

A Fordson power unit with a Nelson power take-off, driving the loading machinery direct from the Fordson engine, independent of tractor transmission, which is used for traction and crowding only, features this machine, The power drives are all-steel roller chains. A long, rigid-truss steel boom with closed panels to protect the operator is built with a high discharge point and sufficient reach to fill the largest truck well forward and without top trimming. The conveyor is the double-strand chain and scraper type driven through cut-steel gears running in oil. The ice-cutting spiral feeder is arranged to cut full width in advance of the pavement scraper, removing ice and other obstacles and feeding the broken snow into the conveyor. The operator stationed at the side of the loader has all of the controls in easy reach.

During the heavy snowfall of January, 1925, the Nelson snow loader was thoroughly tested by the Bureau of Snow Removal, New York. Under average conditions, the capacity of the loader ran about 3 cubic yards per minute, varying with the condition of the snow. Most of the work was in attacking old snow that had turned into ice and was practically irremovable by ordinary methods. In attacking 6-foot piles of rather soft re-frozen snow, 14 loads were handled, the longest of which took 3½ minutes to load, the shortest of which took 2¾ minutes, giving an average of 3.09 minutes per load. Twenty-five loads of 5-foot piles of hard re-frozen snow required 5 minutes for the longest loading time and 1.75 minutes for the shortest, the average being 3.13 minutes.

An 8-inch snowfall means moving about 100 cubic yards of snow per city block of 260 feet, or 2,000 yards per mile. Based on fresh snow already plowed to the curb or piled, the cost of loading this snow will be about as shown in the table below. If the snow has frozen again so that the piles must be picked, the cost will be at least doubled in the case of hand labor, while the capacity of the Nelson loader is reduced but little, except where the snow has turned into hard ice.

Unit Gang	City Work 8 to 12 laborers @ $0.50 per hour	Contract Work 4 good laborers @ $0.67½c.	Nelson Loader 2 laborers @ $.62½ 1 operator @ $1.00
Cost per hour.....	$ 6.00	$ 2.70	$ 2.25
Eight-yard trucks loaded per hour	3	3	15
Labor cost per load..	$ 1.67	$ 0.90	$ 0.15
Labor cost per mile...	$400.00	$225.00	$37.50
Time required for one gang to clear one mile.	10 days	10 days	2 days

Changes in Ideal Power Lawn Mower Personnel

The Ideal Power Lawn Mower Company, Lansing, Mich., has announced that H. W. Hively has succeeded Joe M. Egloff as Factory Representative in Ohio, Western Pennsylvania, Virginia, and Kentucky. Mr. Egloff has been made Branch Manager of the Chicago office, 11 East Harrison Street, Chicago, Ill.

St. Louis Lighting Contract Awarded to Westinghouse

One of the largest contracts for street-lighting equipment ever placed, consisting of 10,000 standard lighting units, reflectors and auxiliary equipment, has just been awarded to the Westinghouse Electric & Manufacturing Company, through the Ryckoff Construction Company of Chicago, for a new street-lighting system for St. Louis.

NELSON LOADER MAKING QUICK WORK OF A PILE OF FROZEN SNOW ON CITY STREET

DON'T WORRY ABOUT THAT SNOW-STORM

Your "H. P. Grader" Will Do the Work

There's nothing better made for snow removal than the H. P. One-Man Grader, with Fordson Tractor and H. P. Rigid Rail Tracks.

The Rigid Rail Tracks assure perfect traction and greatly increase the pulling power of your tractor.

Snow removal, as well as grading, is done at least expense with the

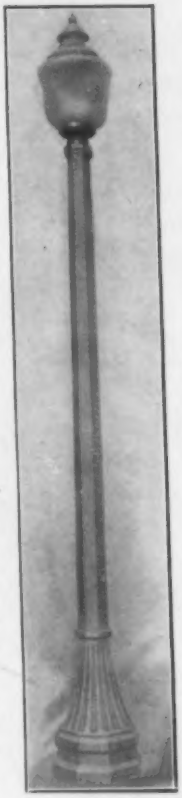
H. P. ONE-MAN GRADER

Write for illustrated circular

THE HADFIELD-PENFIELD STEEL CO.
BUCYRUS **OHIO**

Concrete Street-Lighting Standards

The greatest care must be taken in the selection of a lighting standard to meet the requirements of the present day for more beautiful streets and to cope with the extremely crowded conditions of our highways. Four essential points must be given consideration—first cost, maintenance cost, beauty, and strength. The concrete lighting standard, as manufactured by the special process of the Chicago Concrete Post Company, Lawrence, Lamon and Leland Avenues, Chicago, Ill., meets these requirements. Concrete lighting standards are permanent and require no maintenance such as painting and rust-proofing. There are no joints to collect the rain and snow and nothing exposed to rust.



THE NEW CHICAGO POST

The maintenance cost on some old lighting standards has forced officials to specify concrete lighting standards for future installations. During the last year the Chicago Concrete Post Company has manufactured 1,500 posts of special design for the main boulevards of the South Park District of Chicago. The city of Chicago selected the concrete lighting standard and placed an order in the last year for 14,800 Chicago concrete posts for rehabilitation of a part of its lighting system.

The concrete post made by this company is manufactured of selected granite aggregates which sparkle both in the daylight and from the rays of the standard's illumination at night. The concrete is slowly poured into metal molds which insure uniformity and clean-cut edges, while the mold is jogged or vibrated by special machines which make it possible to observe the manufacture of the post from beginning to end. There is no blind work. In this manner all possibility of air pockets which will in time cause cracks is eliminated. During the operation of pouring, the reinforcing rods and iron pipe for wiring in the center, which are cast directly into the post, are held in a rigid position; this prevents the creeping of the rods to the surface, which would eventually cause rust to discolor the concrete.

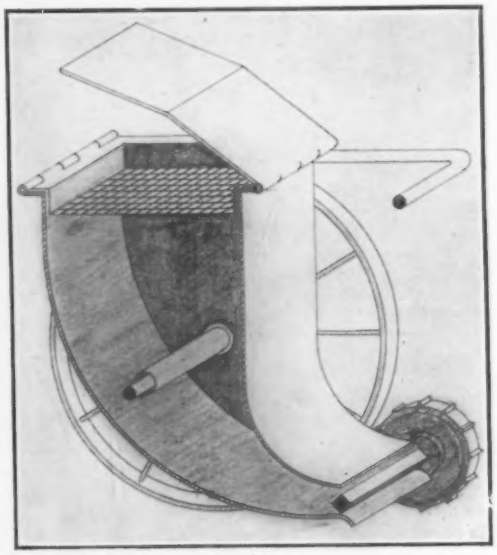
The strength of the concrete post is insured by testing the portland cement and by four reinforcing rods which meet the requirements of the American Society for Testing Materials. The curing process extends over a period of 27 days, each operation being carefully timed by technical experts. All standards are subject to a treatment which entirely eliminates the outer film of cement, leaving the granite aggregate exposed in its natural state.

An Effective Sidewalk Sander

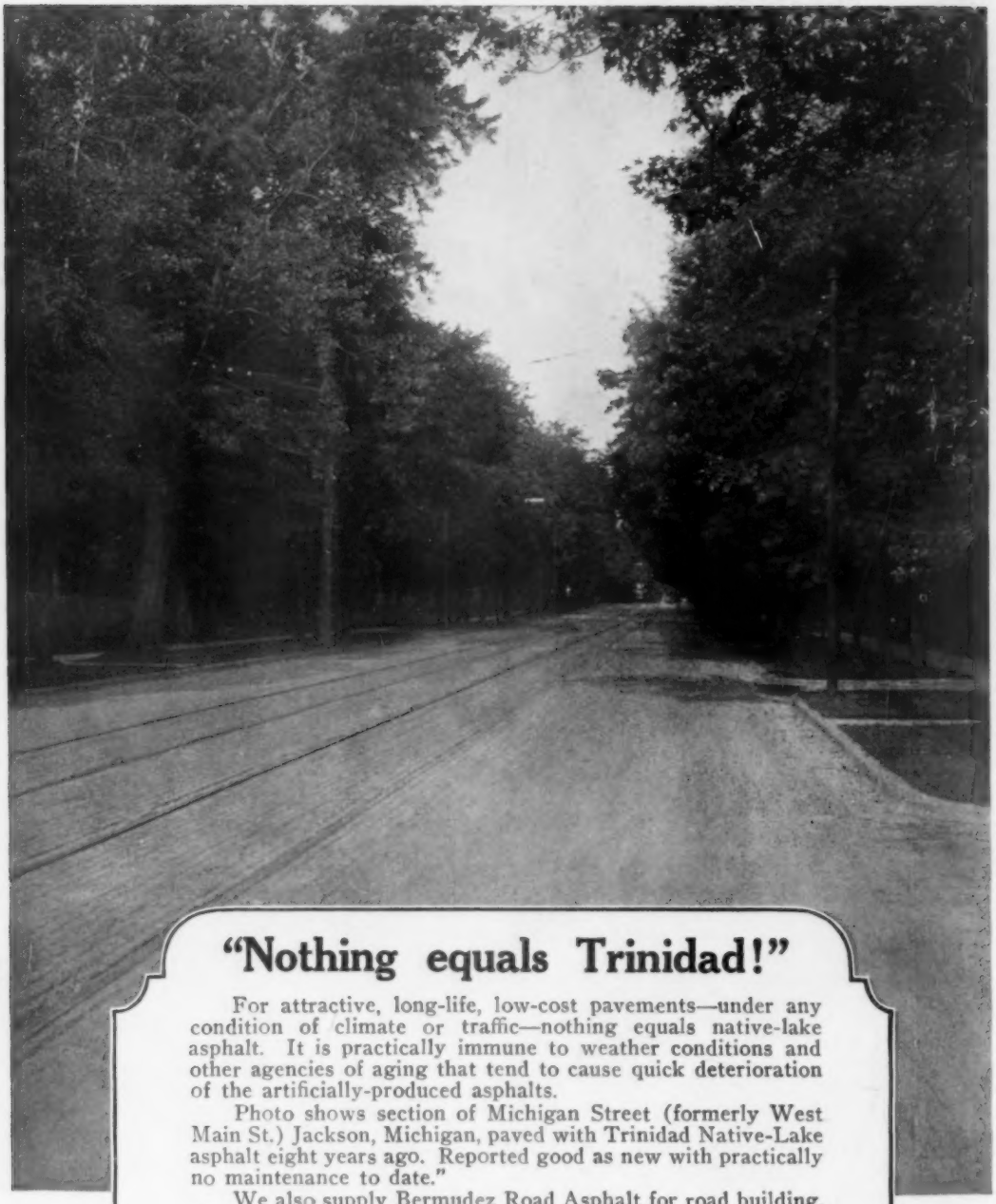
After a great deal of experimental work, the Tarrant Manufacturing Company, Saratoga Springs, N. Y., has developed a sidewalk sander which is unusually durable and serviceable. The sander is mounted on wheels and is of light, yet strong and durable construction. Owing to its peculiar shape, it avoids bringing any pressure whatever at the point of distribution on the distributing axle. The operator can easily distribute sand by simply lowering it until the small wheels in the rear have come in contact with the surface to be sanded, or, if he desires, he may keep the machine in perfect balance, having the rear wheels off the surface and thus carry the sand without distributing until he reaches a point where he wishes to begin sanding. In other words, the machine is idle except when the two small wheels are in contact with the surface.

The axle of the large wheel passes entirely through a hollow tube, so that the sand does not come in contact with it at any time. The top of the machine is fitted with a hinged metal cover to keep out all moisture, and immediately beneath it is a hinged recess screen of heavy meshed wire. All material used in the machine must go through this screen, and the refuse is easily ejected by simply raising the screen on its hinges and dumping the unscreened portion. The body is constructed of No. 20 gage sheet metal, all parts of which are welded. The two large wheels are 30 inches in diameter, and the distributing wheels, which are corrugated to avoid slipping on the ice, are 8 inches in diameter. The operator always has a firm footing on the slippery walk as he walks on the newly sanded surface.

This apparatus will place on a walk with one filling a spread of sand 20 inches wide and approximately 2,000 feet long.



SECTION OF SAND SPREADER



"Nothing equals Trinidad!"

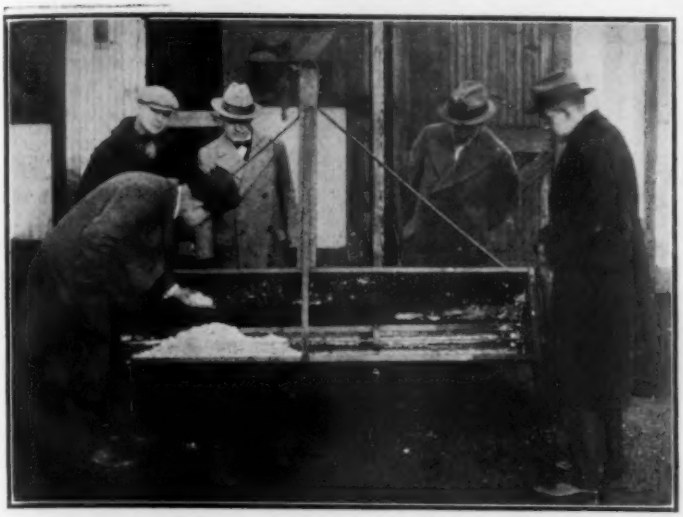
For attractive, long-life, low-cost pavements—under any condition of climate or traffic—nothing equals native-lake asphalt. It is practically immune to weather conditions and other agencies of aging that tend to cause quick deterioration of the artificially-produced asphalts.

Photo shows section of Michigan Street (formerly West Main St.) Jackson, Michigan, paved with Trinidad Native-Lake asphalt eight years ago. Reported good as new with practically no maintenance to date."

We also supply Bermudez Road Asphalt for road building. Write for interesting data.

The Barber Asphalt Company
PHILADELPHIA
New York, Chicago, Pittsburgh, St. Louis, Kansas City, San Francisco

TRINIDAD LAKE ASPHALT



THE NEW I OPE SALT SPREADER TIPPED UP TO SHOW SPIDER

A Salt-Distributing Machine for Ice Removal

One of the quickest ways to melt snow and ice on city streets and county highways is to distribute salt uniformly over the frozen section. A machine for this type of service has been developed by Kent Pope, Pope Equipment Company, 4111 Euclid Avenue, Cleveland, Ohio. The machine can be pulled by a Ford truck or any make of automobile with a speed up to 30 miles an hour and will distribute salt of a suitable thickness 8 feet wide and a mile long in 4 minutes, using about 3,000 pounds of salt, which costs only $1.50.

The operating sifting element of the machine is a patented spider that turns on and off from the automobile seat. The city of Akron, Ohio, is using three machines, and the Cleveland Street Railway Company, Cleveland, Ohio, has several.

If this machine is used when the snow first begins to fall or gets just a few inches deep, it will start the snow melting and will take care of snow 8 or 10 inches deep very well. It is claimed to operate at about one-tenth the cost of snow-plows and snow-brooms. It is especially effective and economical when used on icy streets.

A New Type of Fire-Alarm Box

A new fire-alarm box known as the Herculite fire-alarm box, has been developed by the Gamewell Company, Newton Upper Falls, Mass. In the construction of this box the manufacturers have deviated from the beaten path in fire-alarm box manufacturing. Herculite, a metal new to the fire-alarm business, but with a very satisfactory service record in other industries, has been used in the construction of this box. It is only one-third the weight of cast iron, but is as strong as steel. A recent test at the Massachusetts Institute of Technology laboratories showed the Herculite box to be 25 per cent stronger than the cast iron type.

Die casting has been used in place of the sand casting process in forming Herculite into fire-alarm boxes. A permanent die turns out boxes of a uniform size, permitting box doors to be changed without the necessity of filing and fitting. Coarseness and pin-holding, two objectionable features found in sand casting, are entirely eliminated in the new die cast box. The general appearance of the box itself is greatly improved.

The conduit entrances on the new box have been re-designed to allow a T B bushing to be placed on the end of the conduit. This presents a smooth surface over which to bring the wires at the entrance and exit, in contrast to the sharp edges of the box itself over which the wires were formerly brought.

A slight change has been made in the pull handle of the quick-action door. By the addition of a spring below the hinge the pull handle is made self-restoring. Each spring is treated by the "Parkerizing" process, which makes the spring rust-proof. A convenient arrangement at one end of the spring permits the adjustment of its tension. The spring itself is protected by an apron which has been added to the lower part of the pull handle. This is designed in such a way as to draw off any water that might tend to accumulate around the spring. Quick-action doors will be furnished regularly with these boxes unless otherwise requested.

Electro Bleach Promotes Weed

The Electro Bleaching Gas Company, 9 East 41st Street, New York, has announced the promotion of William J. Weed to the position of Assistant Manager of Sales of that organization.

THE NEW HERCULITE FIRE-ALARM BOX, SHOWING HOW AN ALARM IS SENT

WATSON Ash Wagons

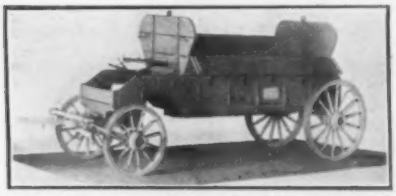
A PROVEN ECONOMICAL COLLECTION UNIT

Lowest Cost on House to House Stop

NEWARK, N. J., STANDARDIZED ON WATSONS
AN EVERY DAY SCENE IN NUMEROUS CITIES

Six 5-yard Watson Bottom Dumping Wagons with teams and harness can be purchased for the Cost of One five-ton Motor Truck—Giving Greater Capacity—With Less Depreciation and upkeep expense.

Watson's may be had equipped with roller bearing axles and solid rubber tires for trailer requirements—one will enable you to practically double the load for your motor truck. Solving the cost on the long haul to the dump.



12 delivered Nov., 1925. City of Rochester, N. Y. Repeats orders for Watsons.

A 5-yard load. No $3,000 to $5,000 equipment idle when loading.

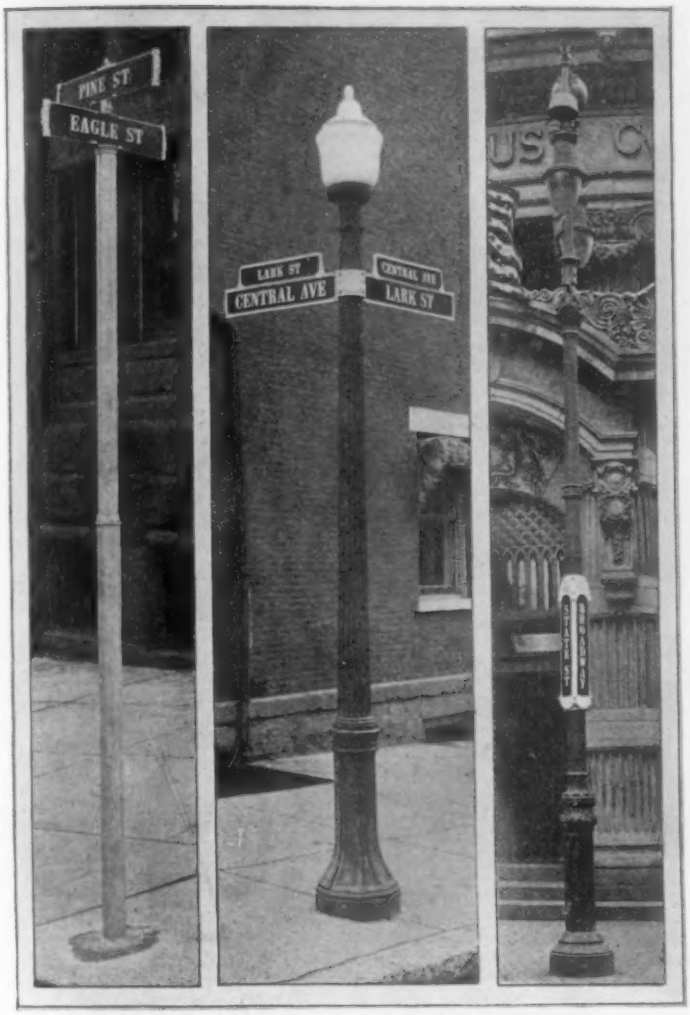
FOR THE STREET

AND PARK DEPTS.

3-YARD WATSONS
40 furnished the City of Pittsburgh in last two years.

Let Watson Bottom Dumping Wagons Keep Your Department Costs Down Where They Should Be.

WATSON TRUCK CORPORATION CANASTOTA, N. Y.



THREE TYPES OF STREET SIGNS FOR ALBANY, N. Y.

Evernu Receives Big Albany Sign Order

An order for 1,600 cross-signs to be erected on opposite corners where streets cross, and on one corner only where streets intersect but do not cross, has been placed by the city of Albany, N. Y., with the Evernu-Century Sign Company, 100 Colonial Road, Boston, Mass. These signs are to be made of Evernu metal, which is a composition guaranteed not to discolor in the atmosphere and which does not corrode. The plates are made of Evernu plate, which is a fiber treated with a substance that transforms the material into a product approaching steel in density, strength, and resistance.

The sign plates are 4 inches wide and sufficiently long to carry the name in 2-inch raised letters without crowding. The letters are cast with studs projecting from their backs, and holes are drilled in the plates to correspond with the studs in the letter, which are then riveted securely in place. Two of these plates thus mounted placed back to back make a sign reading on both sides. One sign is placed above the other on an adjustable mounting, so that the relative position of the plates may be almost any angle. A lock rivet prevents the changing of the angle. The connection between the post and the sign is provided with a concealed lock, so that after once being placed, the sign cannot be disturbed or removed without mechanical means.

The posts are 11 feet in length, being made up of 7 feet of 3-inch and 4 feet of 2½-inch steel tubing connected with an aluminum split collar, over which the two sizes of tubing are forced in a 15-ton press. In addition, they are securely pinned. A section of 22-gage polished aluminum tubing is slipped over the exposed portions of the post before it is set in place. Excavation 12 inches in diameter and 3 feet deep is made to receive the posts, which are set 24 inches in the concrete base.

The wing signs, which are of the double line type, are made of a plate 5½ inches wide with 3-inch letters. The upper line is made of 2-inch letters mounted on 4-inch plates, both of which are encased in ornamental mountings on Evernu metal. Rings made in halves are bolted to the boulevard standards. This ring is provided with annular recesses which receive projections from the sign bracket and when bound firmly to the post securely hold the sign plates, which may be placed at any angle corresponding to the angle of the street intersection. These signs are placed on all streets where boulevard lighting standards are in service. The larger type used in these signs makes them particularly distinct and clear.

On State Street, leading from Broadway up the hill to the Capitol building, vertical signs are used which are a departure in sign practice. These signs are made to blend into the ornamental effect of the lighting standards and are fitted to the poles by special attachments. Molded into the metal at the top is a seal of the city on each of the four sides. This sign has the advantage of not being exposed to damage by projecting parts. As most of the street names are short, there is little difficulty experienced in reading the names arranged vertically. These signs are of uniform dimensions, regardless of the length of name.

Calendars Available

Readers of THE AMERICAN CITY may secure attractive wall calendars by writing the following companies on their official letterheads and mentioning this magazine: Alpha Portland Cement Co., Easton, Pa.; General Electric Co., Schenectady, N. Y., and Hersey Mfg. Co., South Boston, Mass.

MOTOR TRUCKS STREET CARS

NEED THE SAME

SOLID TRACK FOUNDATION

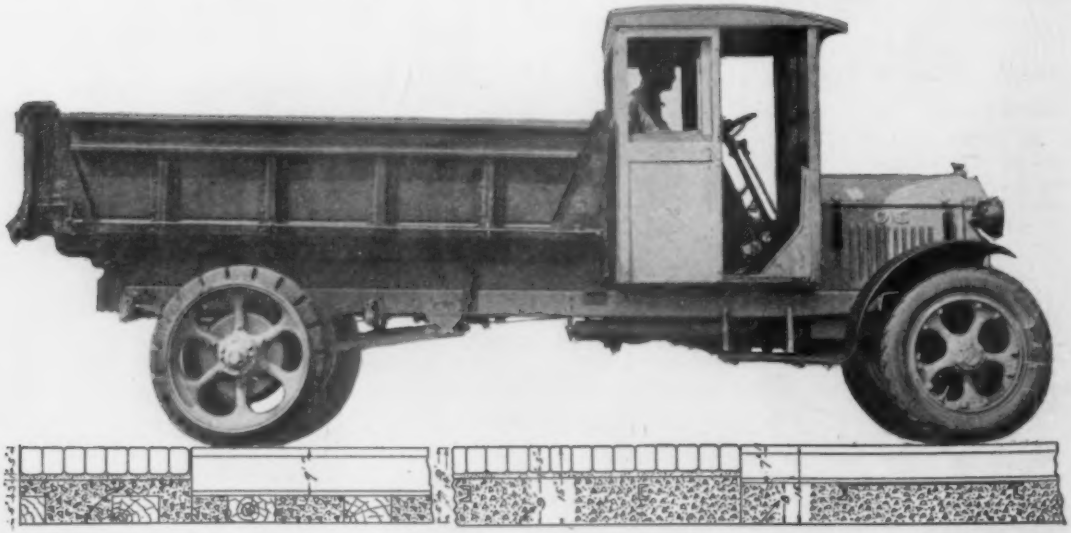
Motor trucks have wheel-loads as heavy as street cars.

The additional support afforded by

International
STEEL TWIN TIES

is indicated by the illustration below. Notice that the rear wheels of this truck are resting on a typical longitudinal cross-section of track using wood ties—the front wheels on a standard steel tie cross-section. Notice how the wood ties break up the paving support and reduce its depth while the steel tie track is all-effective as paving foundation.

With **Steel Twin Ties** there is no likelihood of the development of voids or gaps in the concrete where water may collect and start progressive track troubles.

Write for our illustrated catalog, describing "New Construction Methods for Renewable Paved Track."

The INTERNATIONAL STEEL TIE CO.
CLEVELAND - - - - OHIO